Airwell

Service Manual

CKF Cassette R410A Series

Indoor Units	Outdoor Units	Indoor Units	Outdoor Units
CKF024	GCN 24RC	CKF030	GCN 30NT
	GCN 24RCT	CKF036	GCN 37NRC
	GCN 24		GCN 37NRCT
	GCN 24T		GCN 37N
CKF030	GCN 30NRC		GCN 37NT
	GCN 30NRCT	CKF045	GCN 47NRCT
	GCN 30N		GCN 47NT



REFRIGERANT

R410A

COOLING ONLY

HEAT PUMP

SM CKFRPM 1-A.0 GB

APRIL 2009

CONTENTS

LIST OF EFFECTIVE PAGES

Note: Changes in the pages are indicated by a “Revision#” in the footer of each effected page (when none indicates no changes in the relevant page). All pages in the following list represent effected/ non effected pages divided by chapters.

Dates of issue for original and changed pages are:

Original .... 0 .... April 2009

Total number of pages in this publication is 129 consisting of the following:

Page No.	Revision No. #		Page No.	Revision No. #		Page No.	Revision No. #

- Zero in this column indicates an original page.

*Due to constant improvements please note that the data on this service manual can be modified with out notice.
**Photos are not contractual

Table of Contents

1. INTRODUCTION

1.1 General

The Cassette (900X900) split ceiling mounted range comprise the ST (cooling only) and RC (heat pump) models, as follows:

- **CKF024**
- **CKF030**
- **CKF036**
- **CKF045**

1.2 Main Features

The (900X900) Cassette series benefits from the most advanced technological innovations, namely:

- R410A units
- Microprocessor control.
- Indoor spacial centrifugal fan for low noise operation
- High COP.
- Easy access to interconnecting tubing and wiring connections,
- Integral condensate water pump.
- Automatic treated air sweep.
- Easy installation and service.

1.3 Indoor Unit

The indoor unit is a ceiling mounted, and can be easily fitted to many types of residential and commercials applications.

<u>It includes:</u>

- Square bended coil with hydrophilic aluminum fins.
- A large diameter centrifugal fan
- Motorized flaps
- Advanced electronic control box assembly.

1.4 Filtration

The Cassette series presents with easily accessible, and re-usable pre-filters (mesh)

1.5 Control

The microprocessor indoor controller, and an infrared remote control, supplied as standard, provide complete operating function and programming. For further details please refer to the Operation Manual, Appendix A.

1.6 Outdoor Unit

The Cassette outdoor units can be installed as floor or wall mounted units by using a wall supporting bracket. The metal sheets are protected by anti- corrosion paint work allowing long life resistance. All outdoor units are pre-charged. For further information please refer to the Product Data Sheet, Chapter 2.

It includes :

- Compressor mounted in a soundproofed compartment
- Axial fan.
- Outdoor coil with hydrophilic corrugated fins for RC units.
- Outlet air fan grill.
- Service valves” flare” type connection.
- Interconnecting wiring terminal block.
- Electrical phase protector (on 3PH models).
- Advanced TYPHOON PCB

1.7 Tubing Connections

Flare type interconnecting tubing to be produced on site.
For further details please refer to the Installation Manual, Appendix A.

1.8 Accessories

ASK (All Season Kit):

For low ambient working conditions in cooling, an ASK can be installed.This kit allows cooling operation down to outdoor temp of -10 ºC by gradually controlling the outdoor fan speed motor.

RCW Wall Mounted Remote Control

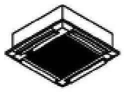
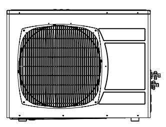
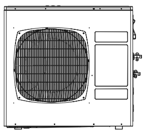
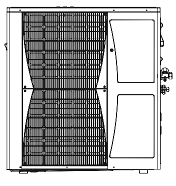
The RCW1/ RCW2 remote control is a wall mounted remote controller, for multi indoor unit applications and functioning
For further details please refer to Optional Accessories, Chapter 14.

1.9 Inbox Documentation

Each unit is supplied with its own installation and operation manuals.

1.10 Matching Table

1.10.1 R410A

OUTDOOR UNITS		INDOOR UNITS			
					
MODEL		CKF024	CKF030	CKF036	CKF045
	GCN 24RC	√			
	GCN 24RCT	√			
	GCN 24	√			
	GCN 24T	√			
	GCN 30NRC		√		
	GCN 30NRCT		√		
	GCN 30N		√		
	GCN 30NT		√		
	GCN 37NRC			√	
	GCN 37NRCT			√	
	GCN 37N			√	
	GCN 37NT			√	
	GCN 47NRCT				√
	GCN 47NT				√

The above table lists outdoor units and **CKF** indoor units which can be matched together. In addition the listed outdoor units can be matched with other types of indoor units such as ducted, wall mounted and floor/ceiling. For further information please refer to the relevant Service Manual.

2. PRODUCT DATA SHEET

2.1 CKF024 / GCN 24, GCN 24RC

Model Indoor Unit				**CKF024**		
Model Outdoor Unit				**GCN 24/24RC**		
Installation Method of Pipe				Flared		
Characteristics			Units	Cooling Only	Cooling	Heating
Capacity (1)			Btu/hr	23,200	23,200	24,150
			kW	6.80	6.80	7.08
Power input (1)			kW	2.30	2.30	2.44
EER (Cooling) or COP(Heating) (1)			W/W	2.96	2.96	2.90
Energy efficiency class				C	C	D
Power supply			V/Ph/Hz	220-240V/1/50Hz		
Rated current			A	9.6	9.6	9.0
Starting current			A	62		
Circuit breaker rating			A	20		
INDOOR	Fan type & quantity			Centrifugal x 1		
	Fan speeds	H/M/L	RPM	540/480/430		
	Air flow (2)	H/M/L	m3/hr	910/800/690		
	External static pressure	Min-Max	Pa	N/A		
	Sound power level (3)	H/M/L	dB(A)	54/51/49		
	Sound pressure level(4)	H/M/L	dB(A)	42/39/36		
	Moisture removal		l/hr	2.5		
	Condensate drain tube I.D		mm	32		
	Dimensions	WxHxD	mm	840x230x840 (Unit) / 955x58x955 (Frame)		
	Weight		kg	26 (unit) / 6 (Frame)		
	Package dimensions	WxHxD	mm	955x247x955 (Unit) / 1035x90x1035(Frame)		
	Packaged weight		kg	34 (unit) / 9 (Frame)		
	Units per pallet		units	8(Unit) / 8 (Frame)		
	Stacking height		units	8 Levels (unit) / 8 Levels (Frame)		
OUTDOOR	Refrigerant control			Capillary tube (restrictor for heating)		
	Compressor type, model			Rotary		
	Fan type & quantity			Axial & 1		
	Fan speeds	H/L	RPM	850		
	Air flow	H/L	m3/hr	3100		
	Sound power level	H/L	dB(A)	67		
	Sound pressure level(4)	H/L	dB(A)	58		
	Dimensions	WxHxD	mm	900x680x340		
	Weight		kg	74		
	Package dimensions	WxHxD	mm	985x730x435		
	Packaged weight		kg	77		
	Units per pallet		Units	6		
	Stacking height		units	2 Levels		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg/m	2.16kg/12.5m		
	Additional charge per 1 meter		g/m	25		
	Connections between units	Liquid line	In.(mm)	3/8"(9.53)		
		Suction line	In.(mm)	5/8"(15.88)		
		Max .tubing length	m.	Max.30		
		Max .height difference	m.	Max.15		
Operation control type				Remote control		
Heating elements			kW			
Others				Crankcase heater (50W), ASK – Factory Option		

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.2 CKF024 / GCN 24T, 24RCT

Model Indoor Unit				**CKF024**		
Model Outdoor Unit				**GCN 24T/24RCT**		
Installation Method of Pipe				Flared		
Characteristics			Units	Cooling Only	Cooling	Heating
Capacity (1)			Btu/hr	23,200	23,200	24,150
			kW	6.80	6.80	7.08
Power input (1)			kW	2.26	2.26	2.36
EER (Cooling) or COP(Heating) (1)			W/W	3.01	3.01	3.00
Energy efficiency class				B	B	D
Power supply			V/Ph/Hz	400V/3N/50Hz		
Rated current			A	3 x 4.1	3 x 4.1	3 x 4.3
Starting current			A	30		
Circuit breaker rating			A	3 x 10		
INDOOR	Fan type & quantity			Centrifugal x 1		
	Fan speeds	H/M/L	RPM	540/480/430		
	Air flow (2)	H/M/L	m3/hr	910/800/690		
	External static pressure	Min-Max	Pa	N/A		
	Sound power level (3)	H/M/L	dB(A)	54/51/49		
	Sound pressure level(4)	H/M/L	dB(A)	42/39/36		
	Moisture removal		l/hr	2.5		
	Condensate drain tube I.D		mm	32		
	Dimensions	WxHxD	mm	840x230x840 (Unit) / 955x58x955 (Frame)		
	Weight		kg	26 (unit) / 6 (Frame)		
	Package dimensions	WxHxD	mm	955x247x955 (Unit) / 1035x90x1035(Frame)		
	Packaged weight		kg	34 (unit) / 9 (Frame)		
	Units per pallet		units	8(Unit) / 8 (Frame)		
	Stacking height		units	8 Levels (unit) / 8 Levels (Frame)		
OUTDOOR	Refrigerant control			Capillary tube (restrictor for heating)		
	Compressor type, model			Rotary		
	Fan type & quantity			Axial & 1		
	Fan speeds	H/L	RPM	850		
	Air flow	H/L	m3/hr	3100		
	Sound power level	H/L	dB(A)	67		
	Sound pressure level(4)	H/L	dB(A)	58		
	Dimensions	WxHxD	mm	900x680x340		
	Weight		kg	74		
	Package dimensions	WxHxD	mm	985x730x435		
	Packaged weight		kg	77		
	Units per pallet		Units	6		
	Stacking height		units	2 Levels		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg/m	2.16/12.5		
	Additional charge per 1 meter		g/m	25		
	Connections between units	Liquid line	In.(mm)	3/8"(9.53)		
		Suction line	In.(mm)	5/8"(15.88)		
		Max .tubing length	m.	Max.30		
		Max .height difference	m.	Max.15		
Operation control type				Remote control		
Heating elements			kW			
Others				Crankcase heater (50W), 3 Phase Protector		

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.3 CKF030/ GCN 30N, 30NRC

Model Indoor Unit				**CKF030**		
Model Outdoor Unit				**GCN 30N/30NRC**		
Installation Method of Pipe				Flared		
Characteristics			Units	Cooling Only	Cooling	Heating
Capacity (1)			Btu/hr	28,300	28,300	30,500
			kW	8.30	8.30	8.94
Power input (1)			kW	2.86	2.86	2.88
EER (Cooling) or COP(Heating) (1)			W/W	2.90	2.90	3.10
Energy efficiency class				C	C	D
Power supply			V/Ph/Hz	220-240V/1/50Hz		
Rated current			A	12.3	12.3	12.3
Starting current			A	80		
Circuit breaker rating			A	25		
INDOOR	Fan type & quantity			Centrifugal x 1		
	Fan speeds	H/M/L	RPM	710/650/570		
	Air flow (2)	H/M/L	m3/hr	1200/1120/985		
	External static pressure	Min-Max	Pa	N/A		
	Sound power level (3)	H/M/L	dB(A)	62/59/56		
	Sound pressure level(4)	H/M/L	dB(A)	50/47/45		
	Moisture removal		l/hr	3.2		
	Condensate drain tube I.D		mm	32		
	Dimensions	WxHxD	mm	840x230x840 (Unit) / 955x58x955 (Frame)		
	Weight		kg	26 (unit) / 6 (Frame)		
	Package dimensions	WxHxD	mm	955x247x955 (Unit) / 1035x90x1035(Frame)		
	Packaged weight		kg	34 (unit) / 9 (Frame)		
	Units per pallet		units	8(Unit) / 8 (Frame)		
	Stacking height		units	8 Levels (unit) / 8 Levels (Frame)		
OUTDOOR	Refrigerant control			Capillary tube (restrictor for heating)		
	Compressor type, model			Rotary		
	Fan type & quantity			Axial & 1		
	Fan speeds	H/L	RPM	850		
	Air flow	H/L	m3/hr	3150		
	Sound power level	H/L	dB(A)	69		
	Sound pressure level(4)	H/L	dB(A)	59		
	Dimensions	WxHxD	mm	900x860x340		
	Weight		kg	78		
	Package dimensions	WxHxD	mm	985x907x435		
	Packaged weight		kg	82		
	Units per pallet		units	6		
	Stacking height		units	2 Levels		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg/m	2.20/12		
	Additional charge per 1 meter		g/m	30		
	Connections between units	Liquid line	In.(mm)	3/8"(9.53)		
		Suction line	In.(mm)	5/8"(15.88)		
		Max .tubing length	m.	Max.30		
		Max .height difference	m.	Max.15		
Operation control type				Remote control		
Heating elements			kW			
Others				Crankcase heater (50W), ASK – Factory Option		

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.4 CKF030 / GCN 30NT, 30NRCT

<table>
<tr><td colspan="4">Model Indoor Unit</td><td colspan="3">CKF030</td></tr>
<tr><td colspan="4">Model Outdoor Unit</td><td colspan="3">GCN 30NT/30NRCT</td></tr>
<tr><td colspan="4">Installation Method of Pipe</td><td colspan="3">Flared</td></tr>
<tr><td colspan="3">Characteristics</td><td>Units</td><td>Cooling Only</td><td>Cooling</td><td>Heating</td></tr>
<tr><td colspan="3" rowspan="2">Capacity (1)</td><td>Btu/hr</td><td>28,300</td><td>28,300</td><td>30,500</td></tr>
<tr><td>kW</td><td>8.30</td><td>8.30</td><td>8.94</td></tr>
<tr><td colspan="3">Power input (1)</td><td>kW</td><td>2.86</td><td>2.86</td><td>2.88</td></tr>
<tr><td colspan="3">EER (Cooling) or COP(Heating) (1)</td><td>W/W</td><td>2.90</td><td>2.90</td><td>3.10</td></tr>
<tr><td colspan="3">Energy efficiency class</td><td></td><td>C</td><td>C</td><td>D</td></tr>
<tr><td colspan="3">Power supply</td><td>V/Ph/Hz</td><td colspan="3">400V/3N/50Hz</td></tr>
<tr><td colspan="3">Rated current</td><td>A</td><td>3 x 5.2</td><td>3 x 5.2</td><td>3 x 5.2</td></tr>
<tr><td colspan="3">Starting current</td><td>A</td><td colspan="3">35</td></tr>
<tr><td colspan="3">Circuit breaker rating</td><td>A</td><td colspan="3">3 x 16</td></tr>
<tr><td rowspan="14">INDOOR</td><td colspan="2">Fan type & quantity</td><td></td><td colspan="3">Centrifugal x 1</td></tr>
<tr><td>Fan speeds</td><td>H/M/L</td><td>RPM</td><td colspan="3">710/650/570</td></tr>
<tr><td>Air flow (2)</td><td>H/M/L</td><td>m3/hr</td><td colspan="3">1200/1120/985</td></tr>
<tr><td>External static pressure</td><td>Min-Max</td><td>Pa</td><td colspan="3">N/A</td></tr>
<tr><td>Sound power level (3)</td><td>H/M/L</td><td>dB(A)</td><td colspan="3">62/59/56</td></tr>
<tr><td>Sound pressure level(4)</td><td>H/M/L</td><td>dB(A)</td><td colspan="3">50/47/45</td></tr>
<tr><td colspan="2">Moisture removal</td><td>l/hr</td><td colspan="3">3.2</td></tr>
<tr><td colspan="2">Condensate drain tube I.D</td><td>mm</td><td colspan="3">32</td></tr>
<tr><td>Dimensions</td><td>WxHxD</td><td>mm</td><td colspan="3">840x230x840 (Unit) / 955x58x955 (Frame)</td></tr>
<tr><td colspan="2">Weight</td><td>kg</td><td colspan="3">26 (unit) / 6 (Frame)</td></tr>
<tr><td>Package dimensions</td><td>WxHxD</td><td>mm</td><td colspan="3">955x247x955 (Unit) / 1035x90x1035(Frame)</td></tr>
<tr><td colspan="2">Packaged weight</td><td>kg</td><td colspan="3">34 (unit) / 9 (Frame)</td></tr>
<tr><td colspan="2">Units per pallet</td><td>units</td><td colspan="3">8(Unit) / 8 (Frame)</td></tr>
<tr><td colspan="2">Stacking height</td><td>units</td><td colspan="3">8 Levels (unit) / 8 Levels (Frame)</td></tr>
<tr><td rowspan="20">OUTDOOR</td><td colspan="2">Refrigerant control</td><td></td><td colspan="3">Capillary tube (restrictor for heating)</td></tr>
<tr><td colspan="2">Compressor type, model</td><td></td><td colspan="3">Rotary</td></tr>
<tr><td colspan="2">Fan type & quantity</td><td></td><td colspan="3">Axial & 1</td></tr>
<tr><td>Fan speeds</td><td>H/L</td><td>RPM</td><td colspan="3">850</td></tr>
<tr><td>Air flow</td><td>H/L</td><td>m3/hr</td><td colspan="3">3150</td></tr>
<tr><td>Sound power level</td><td>H/L</td><td>dB(A)</td><td colspan="3">69</td></tr>
<tr><td>Sound pressure level(4)</td><td>H/L</td><td>dB(A)</td><td colspan="3">59</td></tr>
<tr><td>Dimensions</td><td>WxHxD</td><td>mm</td><td colspan="3">900x860x340</td></tr>
<tr><td colspan="2">Weight</td><td>kg</td><td colspan="3">78</td></tr>
<tr><td>Package dimensions</td><td>WxHxD</td><td>mm</td><td colspan="3">985x907x435</td></tr>
<tr><td colspan="2">Packaged weight</td><td>kg</td><td colspan="3">82</td></tr>
<tr><td colspan="2">Units per pallet</td><td>units</td><td colspan="3">6</td></tr>
<tr><td colspan="2">Stacking height</td><td>units</td><td colspan="3">2 Levels</td></tr>
<tr><td colspan="2">Refrigerant type</td><td></td><td colspan="3">R410A</td></tr>
<tr><td colspan="2">Refrigerant chargless distance</td><td>kg/m</td><td colspan="3">2.42/15</td></tr>
<tr><td colspan="2">Additional charge per 1 meter</td><td>g/m</td><td colspan="3">30</td></tr>
<tr><td rowspan="4">Connections between units</td><td>Liquid line</td><td>In.(mm)</td><td colspan="3">3/8"(9.53)</td></tr>
<tr><td>Suction line</td><td>In.(mm)</td><td colspan="3">5/8"(15.88)</td></tr>
<tr><td>Max .tubing length</td><td>m.</td><td colspan="3">Max.30</td></tr>
<tr><td>Max .height difference</td><td>m.</td><td colspan="3">Max.15</td></tr>
<tr><td colspan="3">Operation control type</td><td></td><td colspan="3">Remote control</td></tr>
<tr><td colspan="3">Heating elements</td><td>kW</td><td colspan="3"></td></tr>
<tr><td colspan="3">Others</td><td></td><td colspan="3">Crankcase heater (50W), 3 Phase Protector</td></tr>
</table>

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.5 CKF036 / GCN 37N, GCN 37 NRC

Model Indoor Unit				**CKF036**		
Model Outdoor Unit				**GCN 37N/37NRC**		
Installation Method of Pipe				Flared		
Characteristics			Units	Cooling Only	Cooling	Heating
Capacity (1)			Btu/hr	33,100	33,100	34,500
			kW	9.70	9.70	10.10
Power input (1)			kW	3.55	3.55	3.59
EER (Cooling) or COP(Heating) (1)			W/W	2.73	2.73	2.81
Energy efficiency class				D	D	D
Power supply			V/Ph/Hz	220-240V/1/50Hz		
Rated current			A	16.2	16.2	16.3
Starting current			A	92		
Circuit breaker rating			A	25		
INDOOR	Fan type & quantity			Centrifugal x 1		
	Fan speeds	H/M/L	RPM	610/570/540		
	Air flow (2)	H/M/L	m3/hr	1220/1125/1025		
	External static pressure	Min-Max	Pa	N/A		
	Sound power level (3)	H/M/L	dB(A)	56/53/51		
	Sound pressure level(4)	H/M/L	dB(A)	44/42/40		
	Moisture removal		l/hr	4.1		
	Condensate drain tube I.D		mm	32		
	Dimensions	WxHxD	mm	840x300x840 (Unit) / 955x58x955 (Frame)		
	Weight		kg	32 (unit) / 6 (Frame)		
	Package dimensions	WxHxD	mm	955x317x955 (Unit) / 1035x90x1035(Frame)		
	Packaged weight		kg	40 (unit) / 9 (Frame)		
	Units per pallet		units	6(Unit) / 8 (Frame)		
	Stacking height		units	6 Levels (unit) / 8 Levels (Frame)		
OUTDOOR	Refrigerant control			Capillary tube (restrictor for heating)		
	Compressor type, model			Rotary		
	Fan type & quantity			Axial & 2		
	Fan speeds	H/L	RPM	1150		
	Air flow	H/L	m3/hr	4150		
	Sound power level	H/L	dB(A)	70		
	Sound pressure level(4)	H/L	dB(A)	61		
	Dimensions	WxHxD	mm	900x970x340		
	Weight		kg	87		
	Package dimensions	WxHxD	mm	985x1020x435		
	Packaged weight		kg	91		
	Units per pallet		units	6		
	Stacking height		units	2 Levels		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg/m	2.55/15		
	Additional charge per 1 meter		g/m	30		
	Connections between units	Liquid line	In.(mm)	3/8"(9.53)		
		Suction line	In.(mm)	3/4"(19.05)		
		Max .tubing length	m.	Max.50		
		Max .height difference	m.	Max.25		
Operation control type				Remote control		
Heating elements			kW			
Others				Crankcase heater (50W), ASK – Factory Option		

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.6 CKF036 / GCN 37NT, GCN 37NRCT

Model Indoor Unit				**CKF036**		
Model Outdoor Unit				**GCN 37NT/37NRCT**		
Installation Method of Pipe				Flared		
Characteristics			Units	Cooling Only	Cooling	Heating
Capacity (1)			Btu/hr	32,410	32,410	33.270
			kW	9.50	9.50	9.75
Power input (1)			kW	3.45	3.45	3.47
EER (Cooling) or COP(Heating) (1)			3.45	2.75	2.75	2.81
Energy efficiency class				D	D	D
Power supply			V/Ph/Hz	400V/3N/50Hz		
Rated current			A	3x6.1	3x6.1	3x6.5
Starting current			A	43		
Circuit breaker rating			A	3 x 16		
INDOOR	Fan type & quantity			Centrifugal x 1		
	Fan speeds	H/M/L	RPM	610/570/540		
	Air flow (2)	H/M/L	m3/hr	1220/1125/1025		
	External static pressure	Min-Max	Pa	N/A		
	Sound power level (3)	H/M/L	dB(A)	56/53/51		
	Sound pressure level(4)	H/M/L	dB(A)	44/42/40		
	Moisture removal		l/hr	4.1		
	Condensate drain tube I.D		mm	32		
	Dimensions	WxHxD	mm	840x300x840 (Unit) / 955x58x955 (Frame)		
	Weight		kg	32 (unit) / 6 (Frame)		
	Package dimensions	WxHxD	mm	955x317x955 (Unit) / 1035x90x1035(Frame)		
	Packaged weight		kg	40 (unit) / 9 (Frame)		
	Units per pallet		units	6(Unit) / 8 (Frame)		
	Stacking height		units	6 Levels (unit) / 8 Levels (Frame)		
OUTDOOR	Refrigerant control			Capillary tube (restrictor for heating)		
	Compressor type, model			Rotary		
	Fan type & quantity			Axial & 2		
	Fan speeds	H/L	RPM	1150		
	Air flow	H/L	m3/hr	4150		
	Sound power level	H/L	dB(A)	70		
	Sound pressure level(4)	H/L	dB(A)	61		
	Dimensions	WxHxD	mm	900x970x340		
	Weight		kg	87		
	Package dimensions	WxHxD	mm	985x1020x435		
	Packaged weight		kg	91		
	Units per pallet		units	6		
	Stacking height		units	2 Levels		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg/m	2.45/15		
	Additional charge per 1 meter		g/m	30		
	Connections between units	Liquid line	In.(mm)	3/8"(9.53)		
		Suction line	In.(mm)	3/4"(19.05)		
		Max .tubing length	m.	Max.50		
		Max .height difference	m.	Max.25		
Operation control type				Remote control		
Heating elements			kW			
Others				Crankcase heater (50W), 3 Phase Protector		

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.7 CKF045 / GCN 47NT, GCN 47NRCT

Model Indoor Unit				**CKF045**		
Model Outdoor Unit				**GCN 47NT/47NRCT**		
Installation Method of Pipe				Flared		
Characteristics			Units	Cooling Only	Cooling	Heating
Capacity [1]			Btu/hr	42,150	45,150	45,000
			kW	12.35	12.35	13.20
Power input [1]			kW	4.40	4.40	4.63
EER (Cooling) or COP(Heating) [1]			W/W	2.81	2.81	2.85
Energy efficiency class				C	C	D
Power supply			V/Ph/Hz	400V/3N/50Hz		
Rated current			A	3 x 8.6	3 x 8.6	3 x 8.3
Starting current			A	61		
Circuit breaker rating			A	3 x 20		
INDOOR	Fan type & quantity			Centrifugal x 1		
	Fan speeds	H/M/L	RPM	760/610/570		
	Air flow [2]	H/M/L	m3/hr	1600/1330/1200		
	External static pressure	Min-Max	Pa	N/A		
	Sound power level [3]	H/M/L	dB(A)	64/58/56		
	Sound pressure level[4]	H/M/L	dB(A)	51/45/43		
	Moisture removal		l/hr	5.4		
	Condensate drain tube I.D		mm	32		
	Dimensions	WxHxD	mm	840x300x840 (Unit) / 955x58x955 (Frame)		
	Weight		kg	32 (unit) / 6 (Frame)		
	Package dimensions	WxHxD	mm	955x317x955 (Unit) / 1035x90x1035(Frame)		
	Packaged weight		kg	40 (unit) / 9 (Frame)		
	Units per pallet		units	6(Unit) / 8 (Frame)		
	Stacking height		units	6 Levels (unit) / 8 Levels (Frame)		
OUTDOOR	Refrigerant control			Capillary tube (restrictor for heating)		
	Compressor type, model			Scroll		
	Fan type & quantity			Axial & 2		
	Fan speeds	H/L	RPM	1240		
	Air flow	H/L	m3/hr	4350		
	Sound power level	H/L	dB(A)	71		
	Sound pressure level[4]	H/L	dB(A)	64		
	Dimensions	WxHxD	mm	900x970x340		
	Weight		kg	91		
	Package dimensions	WxHxD	mm	985x1020x435		
	Packaged weight		kg	95		
	Units per pallet		units	6		
	Stacking height		units	2 Levels		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg/m	2.30/15		
	Additional charge per 1 meter		g/m	45		
	Connections between units	Liquid line	In.(mm)	3/8"(9.53)		
		Suction line	In.(mm)	3/4"(19.05)		
		Max .tubing length	m.	Max.50		
		Max .height difference	m.	Max.25		
Operation control type				Remote control		
Heating elements			kW			
Others				Crankcase heater (50W), 3 Phase Protector		

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

3. RATING CONDITIONS

Standard conditions in accordance with ISO 5151, ISO 13253 (for ducted units) and EN 14511.

Cooling:
Indoor: 27°C DB 19°C WB
Outdoor: 35 °C DB

Heating:
Indoor: 20°C DB
Outdoor: 7°C DB 6°C WB

3.1 Operating Limits

		Indoor	Outdoor
Cooling	Upper limit	32°C DB 23°C WB	46°C DB
	Lower limit	21°C DB 15°C WB	21°C DB
Heating	Upper limit	27°C DB	24°C DB 18°C WB
	Lower limit	20°C DB	-9°C DB -10°C WB
Voltage	1PH	198 – 264 V	
	3PH	360 - 440 V	

4. OUTLINE DIMENSIONS

4.1 Indoor Units: CKF024, CKF030, CKF036, CKF045

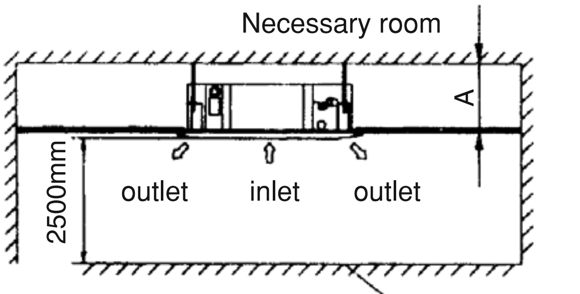


Chart 1

Note: 24/27/30 Series A 260mm
36/45 Series A 330mm

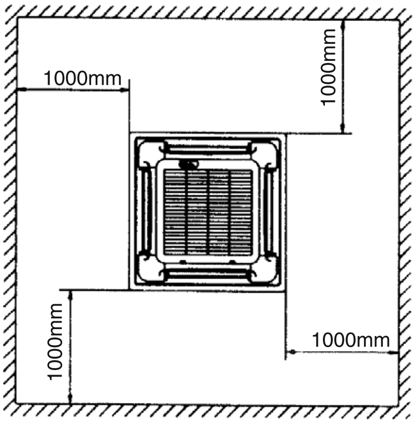
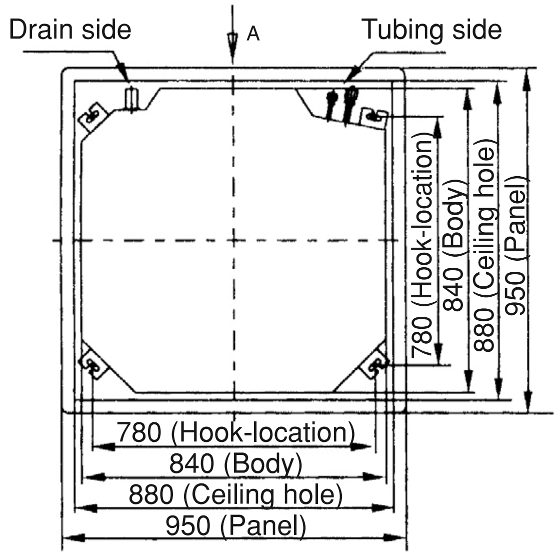


Chart 2



(Unit: mm)

Chart 3

Note: 24/27/30 Series B 240mm
36/45 Series B 310mm

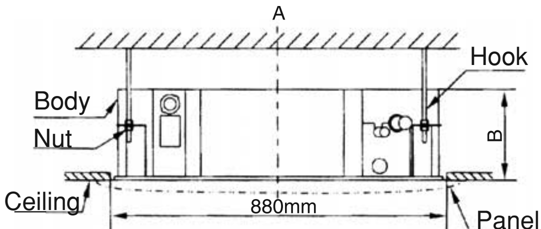


Chart 4

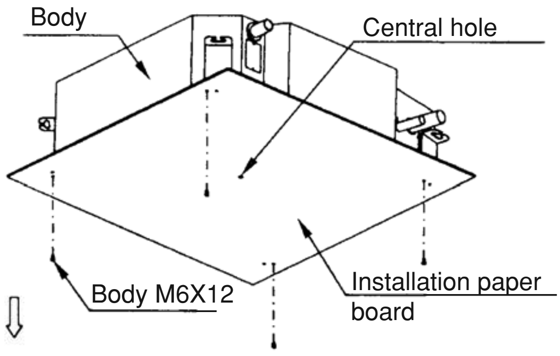


Chart 7

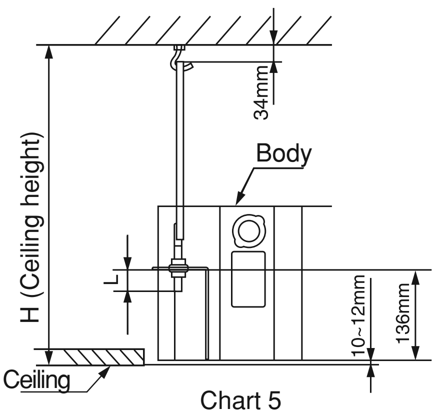


Chart 5

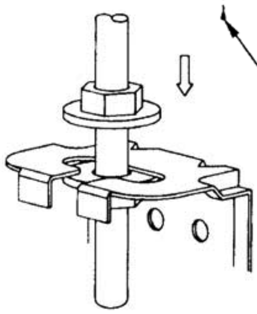
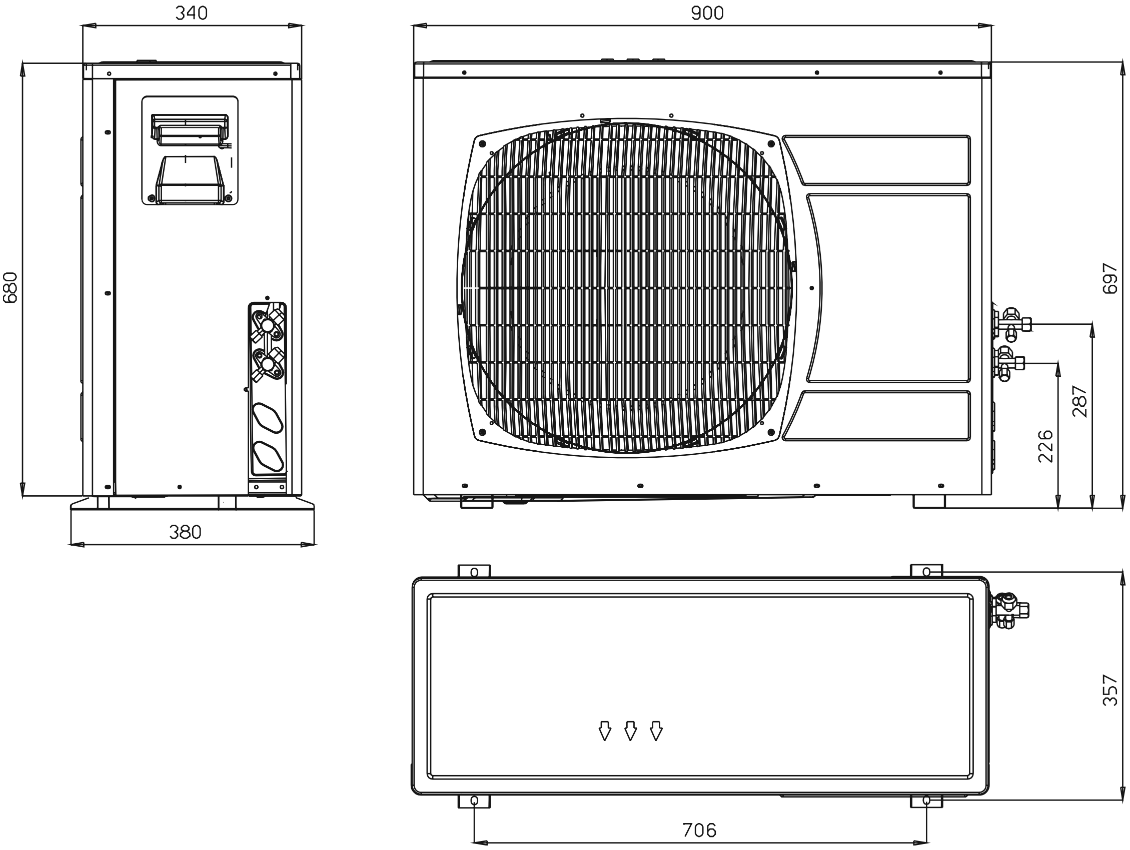
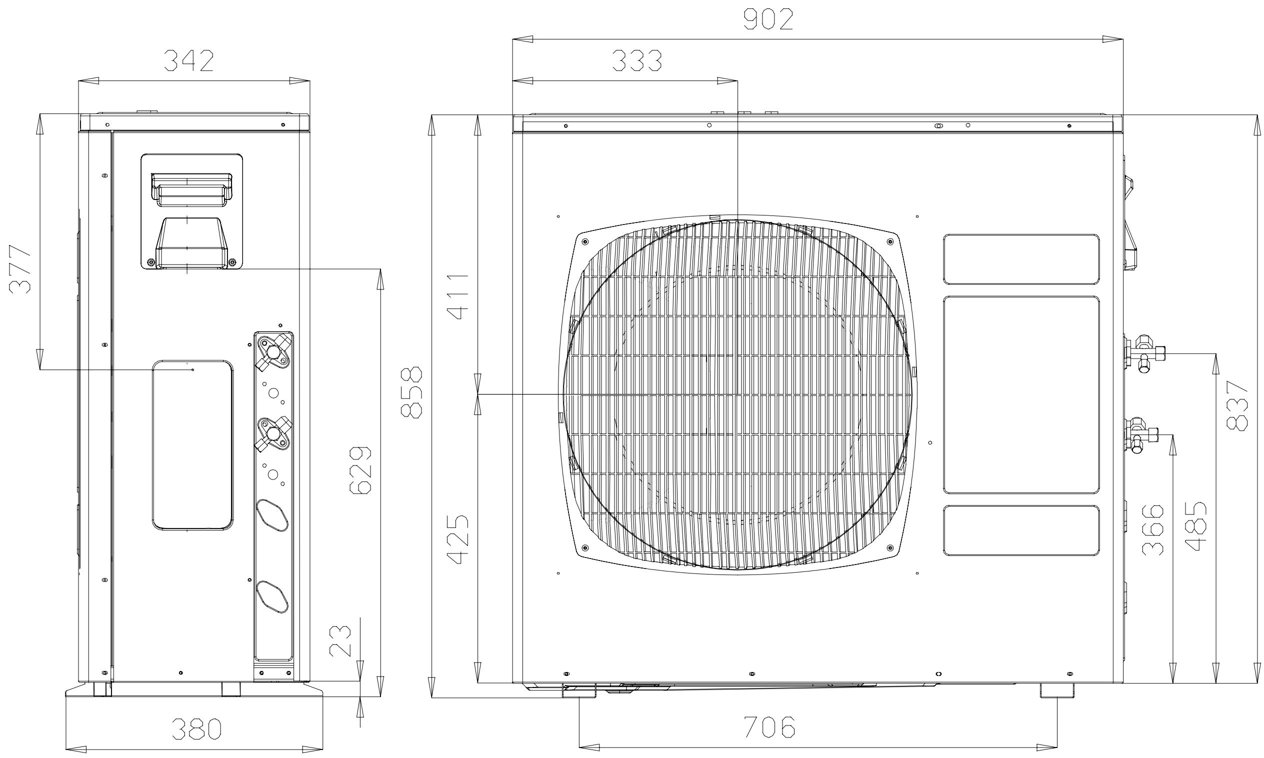


Chart 6

4.2 Outdoor Units: GCN 24, GCN 24T

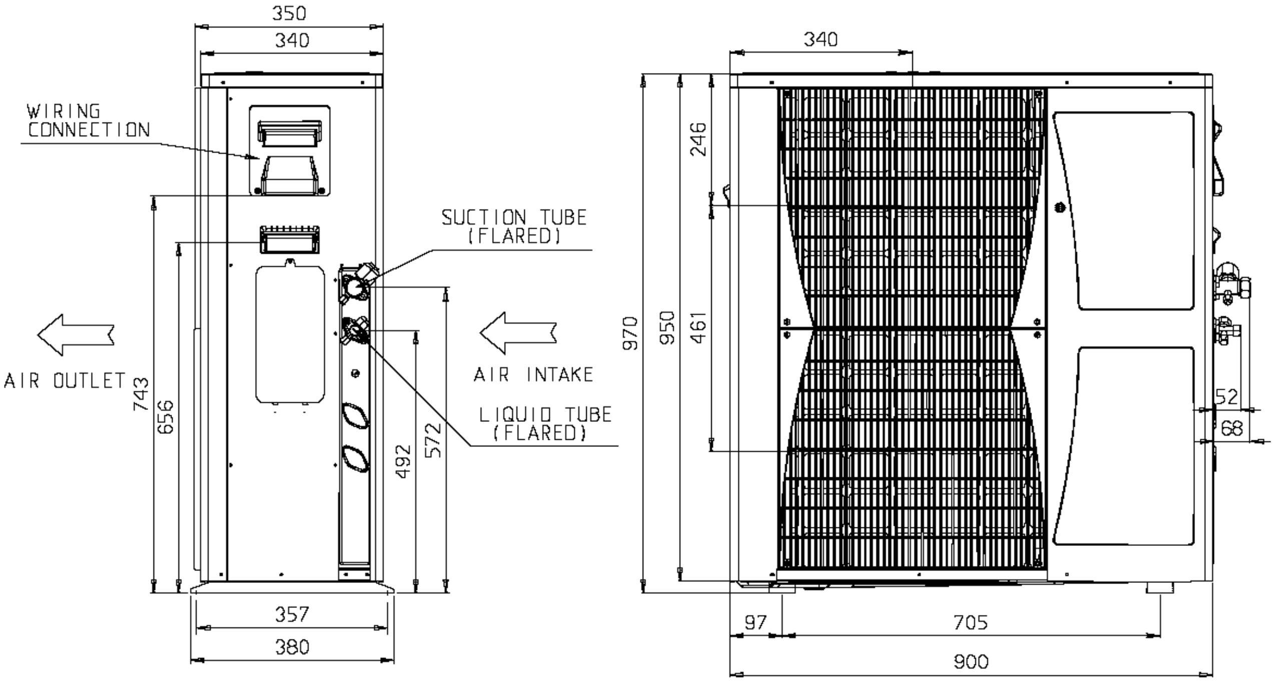


4.3 Outdoor Units: GCN 30N, GCN 30NT



CONTENTS

4.4 Outdoor Units: GCN 37, GCN 37T, GCN 47T



5. PERFORMANCE DATA

5.1 CKF024 / GCN 24

5.1.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OD COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15(1)	TC	7.17	7.42	7.60	7.78	7.90
	SC	4.56	4.76	4.94	5.07	5.16
	PI	1.63	1.63	1.64	1.64	1.65
20(1)	TC	6.93	7.31	7.54	7.72	7.88
	SC	4.47	4.71	4.91	5.05	5.15
	PI	1.77	1.78	1.78	1.79	1.80
25	TC	6.56	7.08	7.45	7.67	7.86
	SC	4.36	4.62	4.88	5.02	5.11
	PI	1.91	1.93	1.94	1.95	1.97
30	TC	6.14	6.68	7.22	7.47	7.70
	SC	4.22	4.49	4.77	4.91	5.00
	PI	2.06	2.09	2.11	2.13	2.15
35	TC	5.68	6.16	**6.80**	7.14	7.48
	SC	4.01	4.30	**4.66**	4.80	4.89
	PI	2.23	2.26	**2.30**	2.32	2.33
40	TC	5.17	5.62	6.14	6.71	7.05
	SC	3.78	4.07	4.41	4.55	4.64
	PI	2.40	2.44	2.48	2.51	2.54
46	TC	4.48	4.90	5.39	5.95	6.42
	SC	3.48	3.73	4.02	4.16	4.25
	PI	2.62	2.66	2.72	2.76	2.79

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 15).

5.1.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	3.72	1.95	3.58	2.08	3.43	2.18
-7	4.00	2.00	3.86	2.11	3.72	2.23
-2	4.25	2.03	4.11	2.15	3.96	2.27
2	5.17	2.12	4.96	2.26	4.74	2.39
6	7.29	2.28	**7.08**	**2.44**	6.83	2.59
10	7.93	2.41	7.72	2.57	7.50	2.75
15	8.57	2.51	8.35	2.71	8.14	2.88
20	9.03	2.59	8.81	2.81	8.57	3.03

* the above chart includes the weighted deicing infleuence.

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

5.2 Capacity Correction Factor Due to Tubing Length (One Way)

TOTAL TUBING LENGTH								
4m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.98	0.97	0.96	0.95	0.94	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

5.2.1 Heating

TOTAL TUBING LENGTH								
4m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.99	0.98	0.97	0.97	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

5.3 CKF024 / GCN 24T

5.3.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OD COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15(1)	TC	7.17	7.42	7.60	7.78	7.90
	SC	4.56	4.76	4.94	5.07	5.16
	PI	1.60	1.61	1.61	1.61	1.62
20(1)	TC	6.93	7.31	7.54	7.72	7.88
	SC	4.47	4.71	4.91	5.05	5.15
	PI	1.74	1.75	1.75	1.76	1.76
25	TC	6.56	7.08	7.45	7.67	7.86
	SC	4.36	4.62	4.88	5.02	5.11
	PI	1.88	1.89	1.91	1.92	1.93
30	TC	6.14	6.68	7.22	7.47	7.70
	SC	4.22	4.49	4.77	4.91	5.00
	PI	2.03	2.06	2.08	2.09	2.11
35	TC	5.68	6.16	**6.80**	7.14	7.48
	SC	4.01	4.30	**4.66**	4.80	4.89
	PI	2.19	2.22	**2.26**	2.28	2.29
40	TC	5.17	5.62	6.14	6.71	7.05
	SC	3.78	4.07	4.41	4.55	4.64
	PI	2.36	2.40	2.44	2.47	2.49
46	TC	4.48	4.90	5.39	5.95	6.42
	SC	3.48	3.73	4.02	4.16	4.25
	PI	2.58	2.62	2.68	2.71	2.74

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 15).

5.3.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	3.72	1.89	3.58	2.01	3.43	2.11
-7	4.00	1.94	3.86	2.04	3.72	2.15
-2	4.25	1.96	4.11	2.08	3.96	2.19
2	5.17	2.05	4.96	2.18	4.74	2.31
6	7.29	2.21	**7.08**	**2.36**	6.83	2.51
10	7.93	2.33	7.72	2.49	7.50	2.66
15	8.57	2.43	8.35	2.62	8.14	2.78
20	9.03	2.50	8.81	2.71	8.57	2.93

* the above chart includes the weighted deicing infleuence.

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

5.4 Capacity Correction Factor Due to Tubing Length (One Way)

TOTAL TUBING LENGTH								
4m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.98	0.97	0.96	0.95	0.94	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

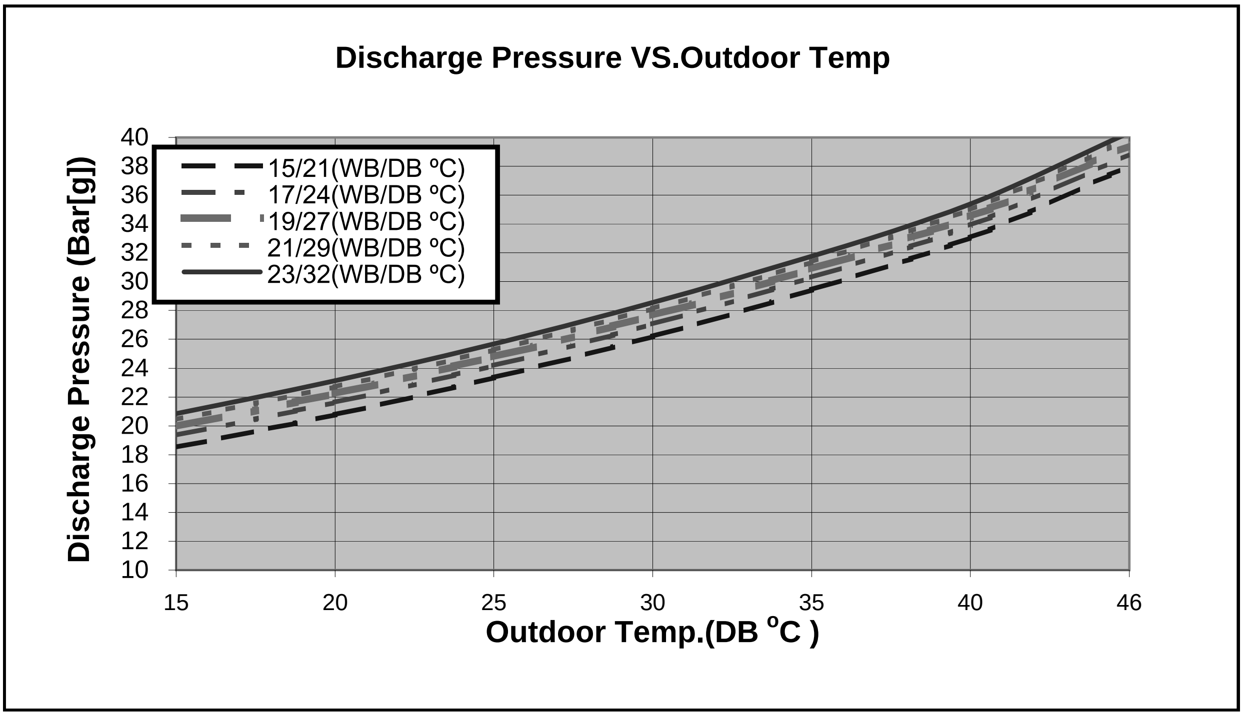
5.4.1 Heating

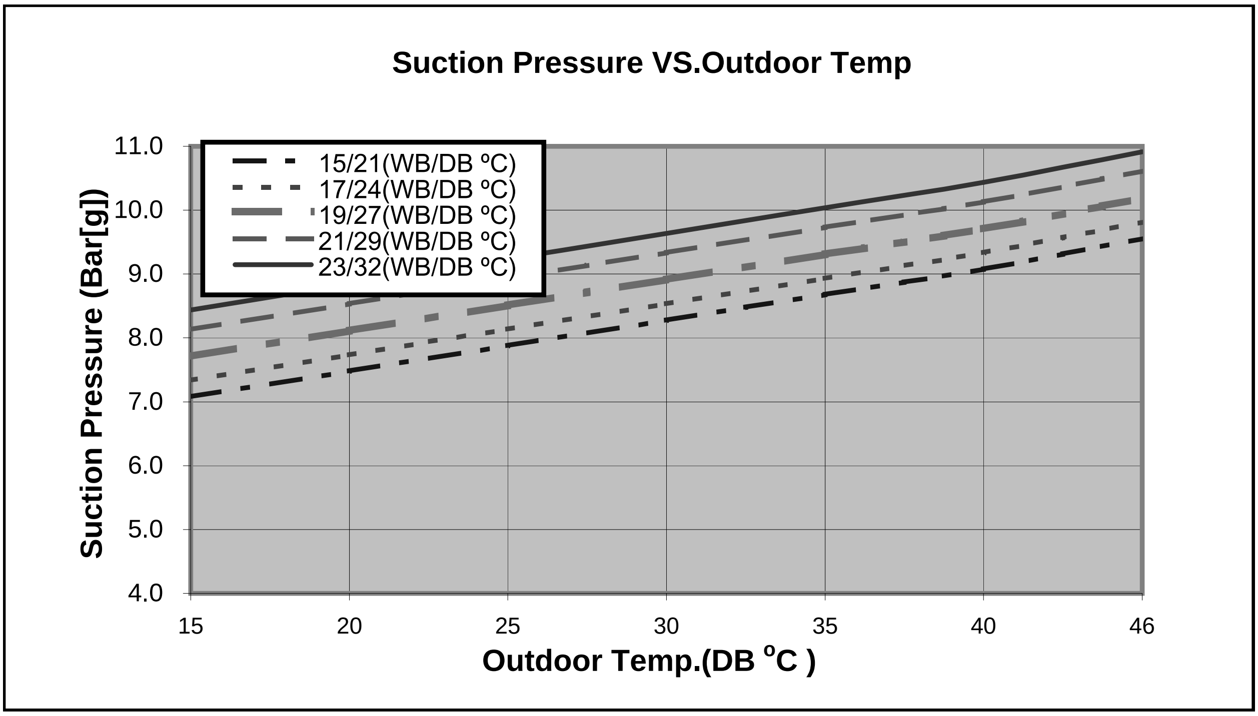
TOTAL TUBING LENGTH								
4m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.99	0.98	0.97	0.97	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

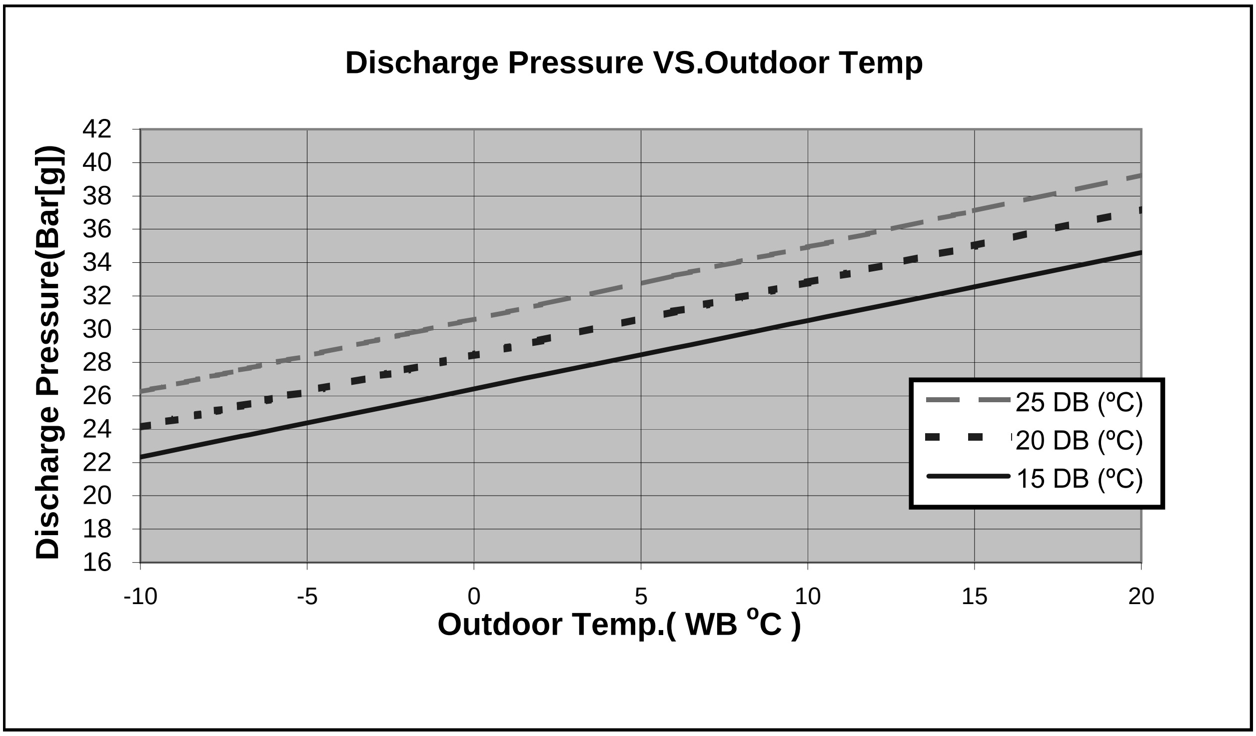
5.5 Pressure Curves.

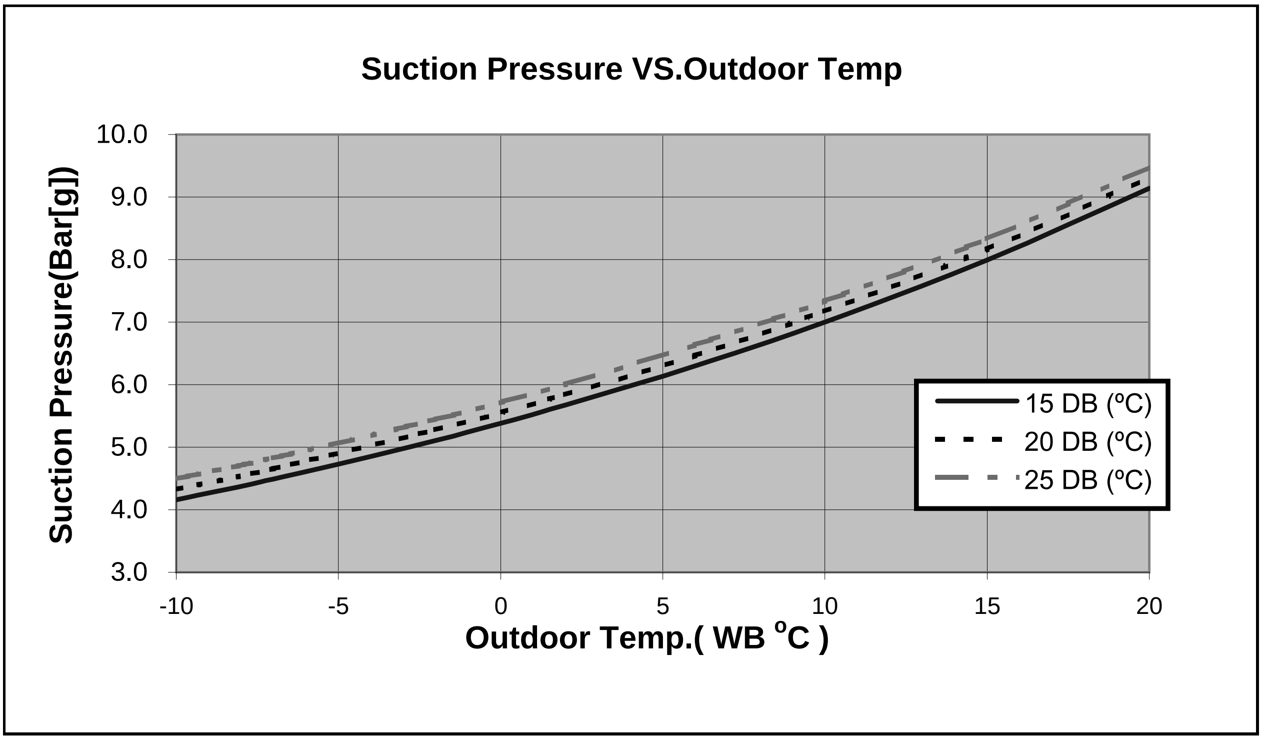
5.5.1 Cooling.





5.5.2 Heating.


Discharge Pressure VS.Outdoor Temp
Discharge Pressure(Bar[g])
42
40
38
36
34
32
30
28
26
24
22
20
18
16
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
25 DB (ºC)
20 DB (ºC)
15 DB (ºC)


Suction Pressure VS.Outdoor Temp
Suction Pressure(Bar[g])
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
15 DB (ºC)
20 DB (ºC)
25 DB (ºC)

5.6 CKF030 / GCN 30N, GCN 30NT

5.6.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OD COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15(1)	TC	8.75	9.06	9.27	9.49	9.64
	SC	6.16	6.42	6.67	6.84	6.97
	PI	2.03	2.03	2.04	2.04	2.05
20(1)	TC	8.46	8.92	9.20	9.42	9.62
	SC	6.04	6.36	6.63	6.82	6.95
	PI	2.20	2.21	2.22	2.23	2.23
25	TC	8.01	8.65	9.09	9.37	9.59
	SC	5.88	6.24	6.58	6.77	6.90
	PI	2.38	2.40	2.41	2.43	2.44
30	TC	7.49	8.15	8.81	9.12	9.39
	SC	5.70	6.06	6.44	6.63	6.75
	PI	2.57	2.60	2.63	2.65	2.67
35	TC	6.93	7.52	**8.30**	8.72	9.13
	SC	5.42	5.81	**6.29**	6.47	6.60
	PI	2.77	2.81	**2.86**	2.88	2.90
40	TC	6.31	6.86	7.49	8.19	8.61
	SC	5.11	5.50	5.95	6.14	6.26
	PI	2.99	3.03	3.08	3.12	3.15
46	TC	5.47	5.98	6.58	7.27	7.83
	SC	4.70	5.04	5.43	5.61	5.74
	PI	3.26	3.31	3.39	3.43	3.47

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 15).

5.6.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	4.69	2.30	4.51	2.45	4.34	2.58
-7	5.05	2.36	4.87	2.49	4.69	2.63
-2	5.36	2.39	5.19	2.53	5.01	2.68
2	6.53	2.51	6.26	2.66	5.99	2.82
6	9.21	2.69	**8.94**	**2.88**	8.63	3.06
10	10.01	2.84	9.74	3.04	9.48	3.25
15	10.82	2.97	10.55	3.20	10.28	3.40
20	11.40	3.05	11.13	3.31	10.82	3.57

* the above chart includes the weighted deicing infleuence.

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

5.7 Capacity Correction Factor Due to Tubing Length (One Way)

TOTAL TUBING LENGTH								
4m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.98	0.97	0.96	0.95	0.94	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

5.7.1 Heating

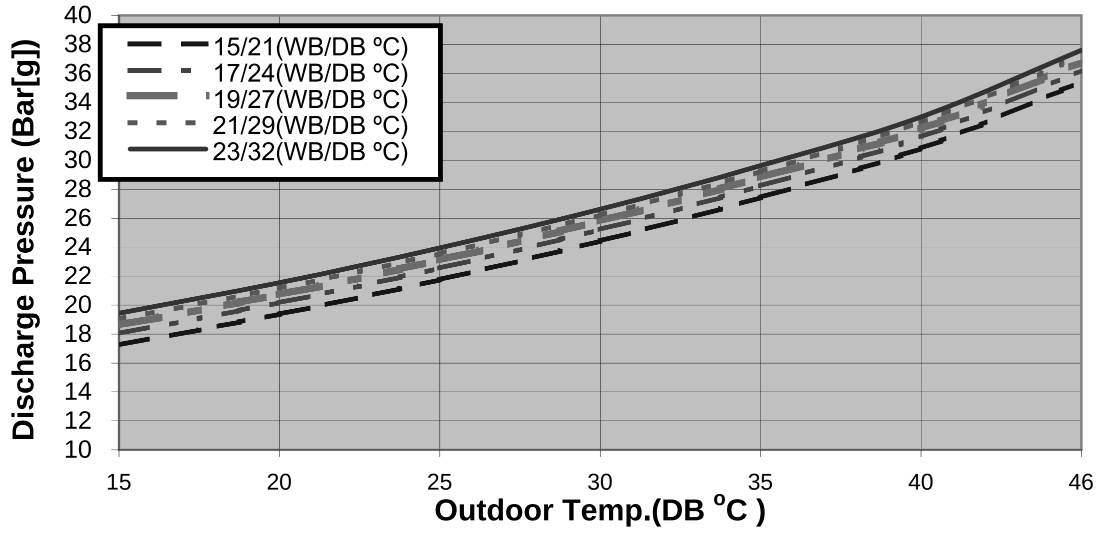
TOTAL TUBING LENGTH								
4m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.99	0.98	0.97	0.97	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

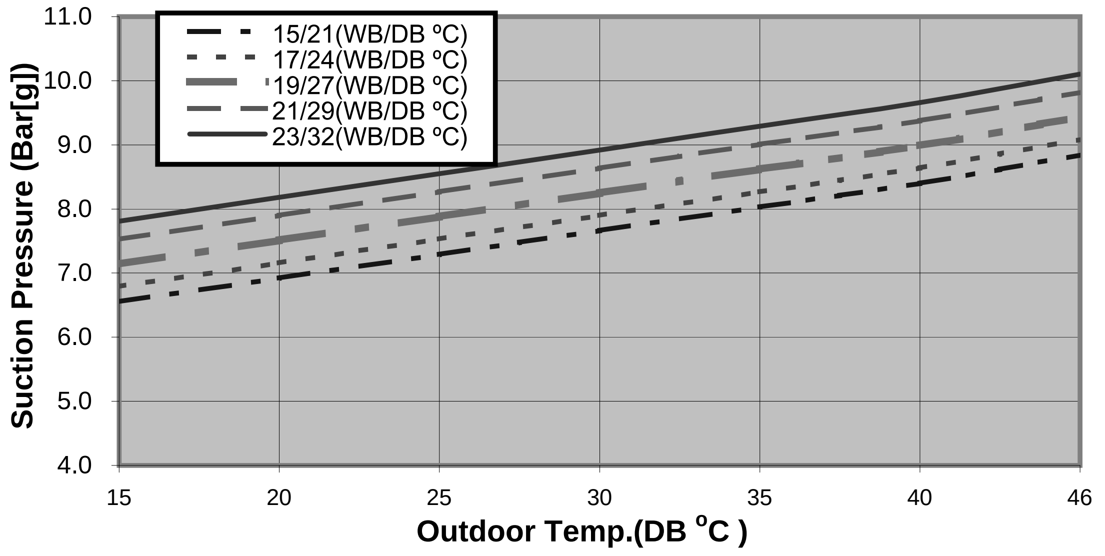
5.8 Pressure Curves.

5.8.1 Cooling.

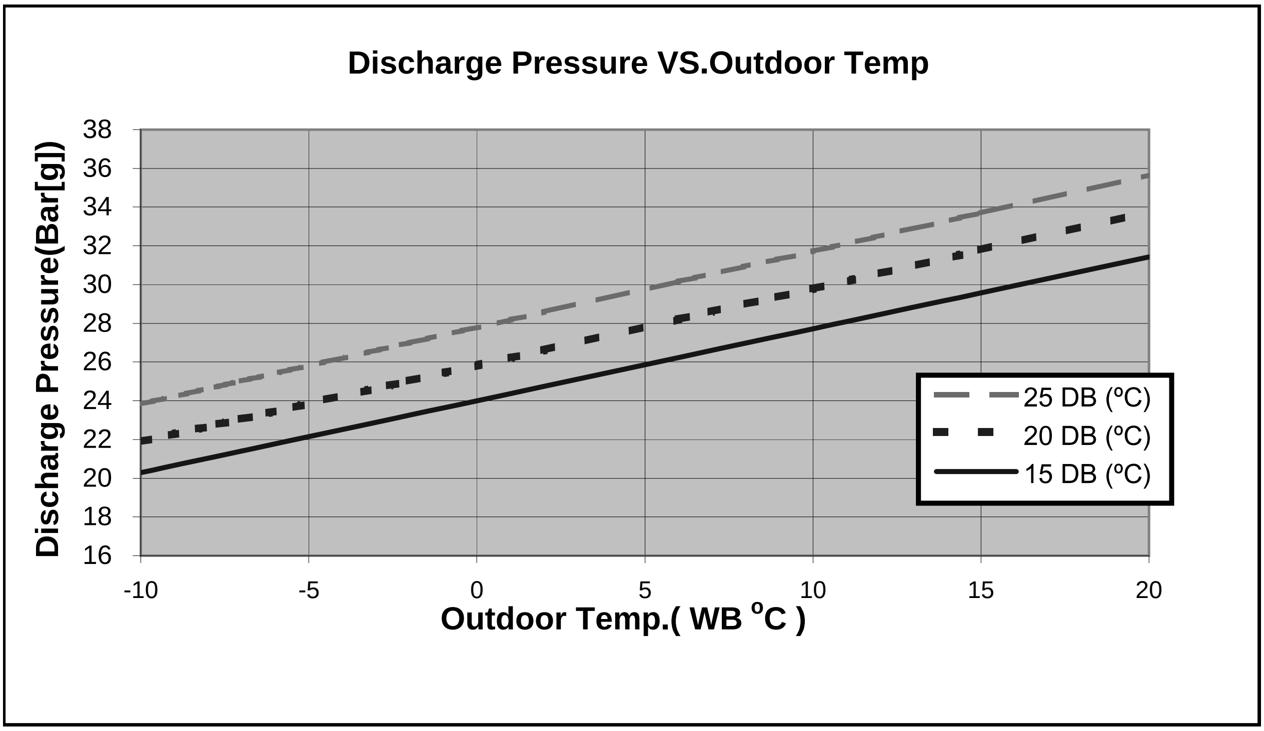
Discharge Pressure VS.Outdoor Temp

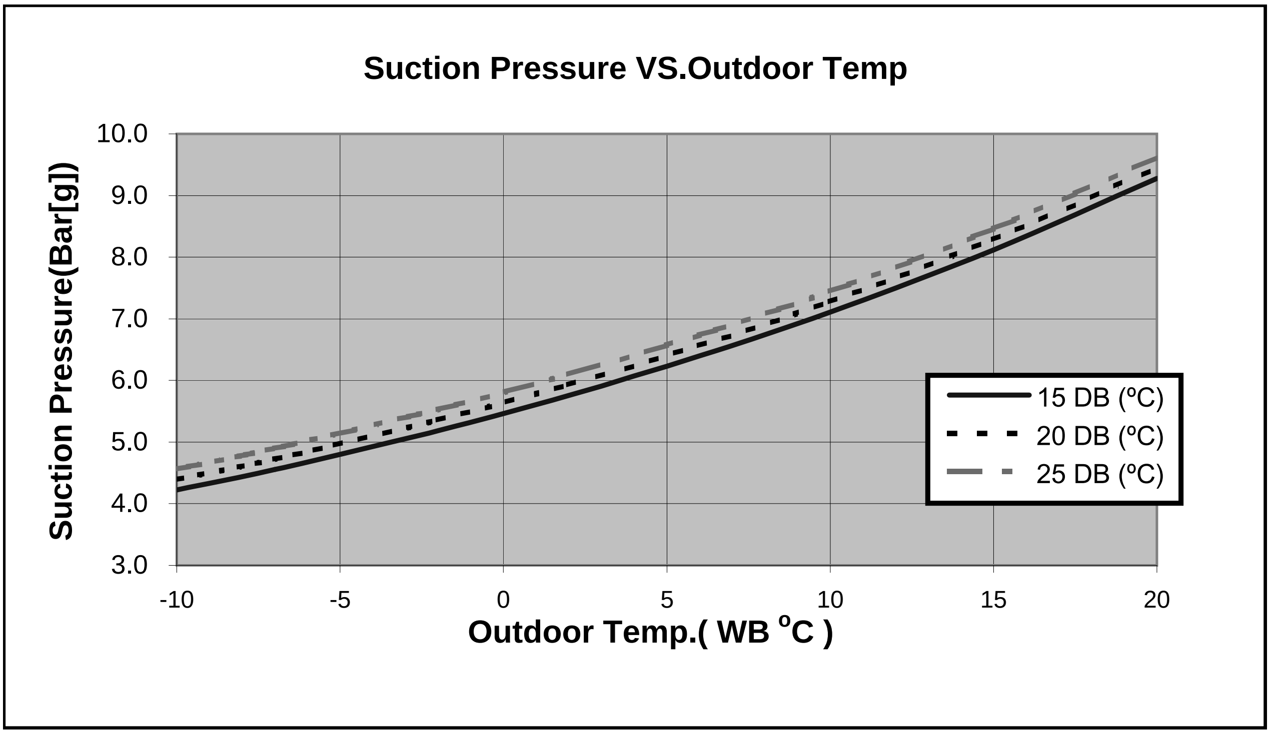


Suction Pressure VS.Outdoor Temp



5.8.2 Heating.


Discharge Pressure VS.Outdoor Temp
Discharge Pressure(Bar[g])
38
36
34
32
30
28
26
24
22
20
18
16
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
25 DB (ºC)
20 DB (ºC)
15 DB (ºC)


Suction Pressure VS.Outdoor Temp
Suction Pressure(Bar[g])
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
15 DB (ºC)
20 DB (ºC)
25 DB (ºC)

5.9 CKF036 / GCN 37N

5.9.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OD COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15(1)	TC	10.22	10.59	10.84	11.10	11.26
	SC	6.55	6.83	7.10	7.28	7.41
	PI	2.52	2.52	2.53	2.53	2.55
20(1)	TC	9.89	10.43	10.76	11.01	11.25
	SC	6.42	6.77	7.06	7.26	7.39
	PI	2.73	2.74	2.75	2.77	2.77
25	TC	9.36	10.10	10.62	10.95	11.21
	SC	6.26	6.64	7.00	7.20	7.34
	PI	2.95	2.97	2.99	3.01	3.03
30	TC	8.75	9.53	10.29	10.66	10.98
	SC	6.06	6.44	6.85	7.05	7.18
	PI	3.19	3.23	3.26	3.29	3.32
35	TC	8.10	8.79	**9.70**	10.19	10.67
	SC	5.76	6.18	**6.69**	6.88	7.02
	PI	3.44	3.49	**3.55**	3.58	3.60
40	TC	7.37	8.02	8.75	9.57	10.06
	SC	5.43	5.85	6.33	6.53	6.66
	PI	3.71	3.76	3.83	3.87	3.91
46	TC	6.39	6.99	7.69	8.49	9.15
	SC	5.00	5.36	5.77	5.97	6.11
	PI	4.05	4.11	4.20	4.26	4.31

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 15).

5.9.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	5.30	2.87	5.10	3.06	4.90	3.21
-7	5.71	2.94	5.50	3.11	5.30	3.27
-2	6.06	2.98	5.86	3.16	5.66	3.34
2	7.37	3.12	7.07	3.32	6.77	3.52
6	10.40	3.36	**10.10**	**3.59**	9.75	3.81
10	11.31	3.54	11.01	3.79	10.71	4.05
15	12.22	3.70	11.92	3.98	11.62	4.24
20	12.88	3.81	12.57	4.13	12.22	4.45

* the above chart includes the weighted deicing infleuence.

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

5.10 Capacity Correction Factor Due to Tubing Length (One Way)

TOTAL TUBING LENGTH								
4m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.98	0.97	0.96	0.95	0.94	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

5.10.1 Heating

TOTAL TUBING LENGTH								
4m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.99	0.98	0.97	0.97	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

5.11 CKF036 / GCN 37NT

5.11.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OD COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15(1)	TC	10.01	10.37	10.62	10.87	11.03
	SC	6.41	6.69	6.95	7.12	7.25
	PI	2.45	2.45	2.46	2.46	2.47
20(1)	TC	9.69	10.21	10.53	10.78	11.01
	SC	6.29	6.63	6.91	7.10	7.24
	PI	2.66	2.66	2.67	2.69	2.69
25	TC	9.17	9.90	10.41	10.72	10.98
	SC	6.13	6.50	6.86	7.05	7.18
	PI	2.87	2.89	2.91	2.93	2.95
30	TC	8.57	9.33	10.08	10.44	10.75
	SC	5.93	6.31	6.70	6.90	7.03
	PI	3.10	3.14	3.17	3.19	3.22
35	TC	7.94	8.61	**9.50**	9.98	10.45
	SC	5.64	6.05	**6.55**	6.74	6.87
	PI	3.34	3.39	**3.45**	3.48	3.50
40	TC	7.22	7.86	8.57	9.37	9.86
	SC	5.32	5.72	6.20	6.39	6.52
	PI	3.60	3.66	3.72	3.77	3.80
46	TC	6.26	6.85	7.53	8.32	8.96
	SC	4.90	5.25	5.65	5.85	5.98
	PI	3.94	3.99	4.09	4.14	4.19

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 15).

5.11.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	5.12	2.78	4.92	2.96	4.73	3.11
-7	5.51	2.85	5.31	3.00	5.12	3.16
-2	5.85	2.88	5.66	3.05	5.46	3.23
2	7.12	3.02	6.83	3.21	6.53	3.40
6	10.04	3.24	**9.75**	**3.47**	9.41	3.69
10	10.92	3.42	10.63	3.66	10.34	3.91
15	11.80	3.57	11.51	3.85	11.21	4.09
20	12.43	3.68	12.14	3.99	11.80	4.30

* the above chart includes the weighted deicing infleuence.

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

5.12 Capacity Correction Factor Due to Tubing Length (One Way)

TOTAL TUBING LENGTH								
4m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.98	0.97	0.96	0.95	0.94	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

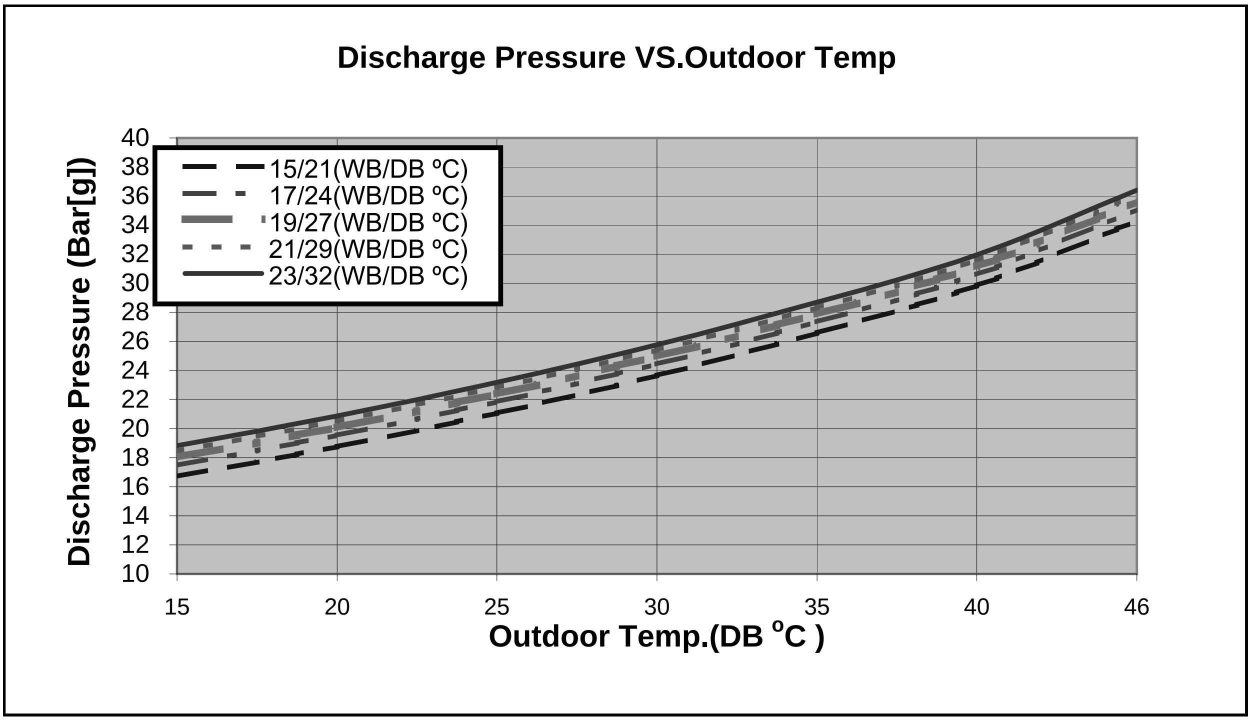
5.12.1 Heating

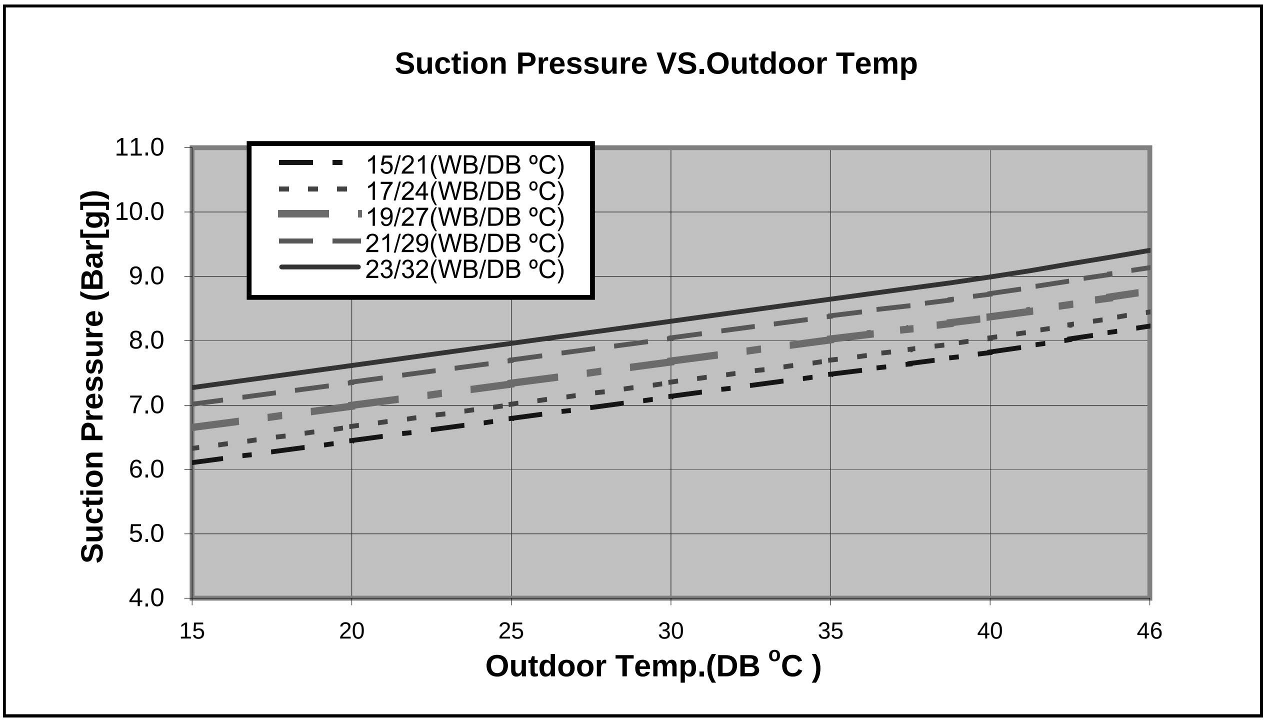
TOTAL TUBING LENGTH								
4m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.99	0.98	0.97	0.97	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

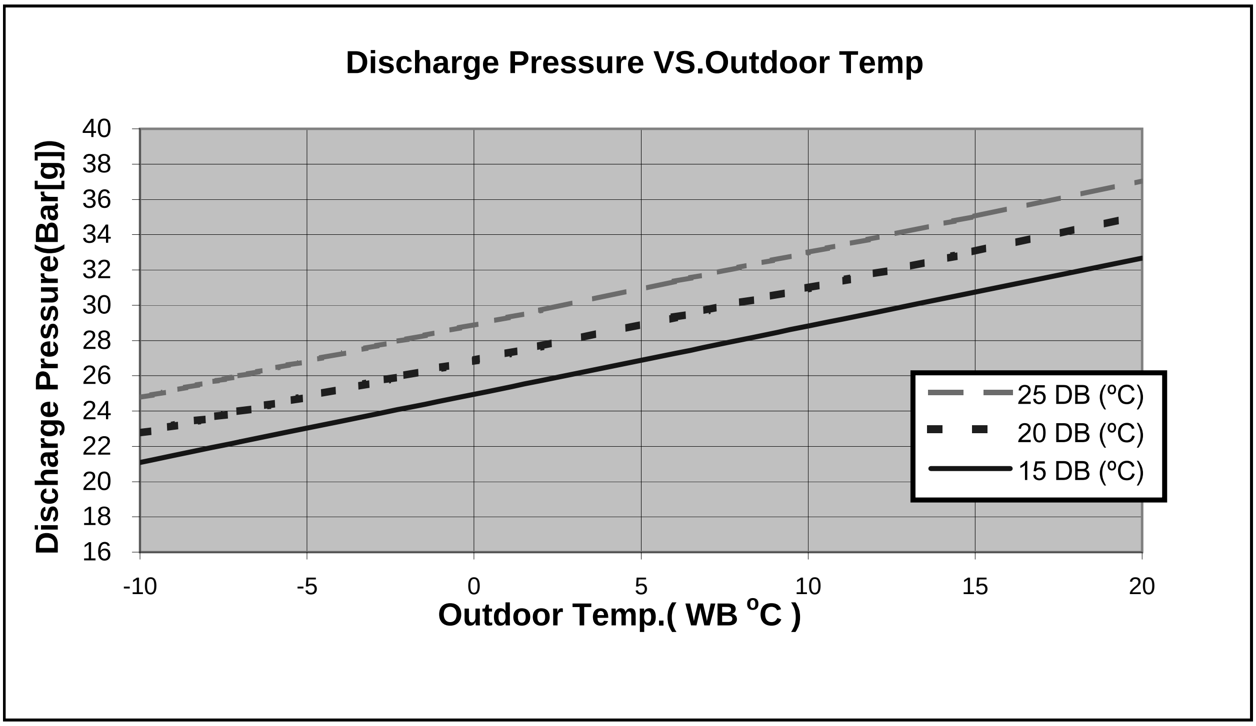
5.13 Pressure Curves.

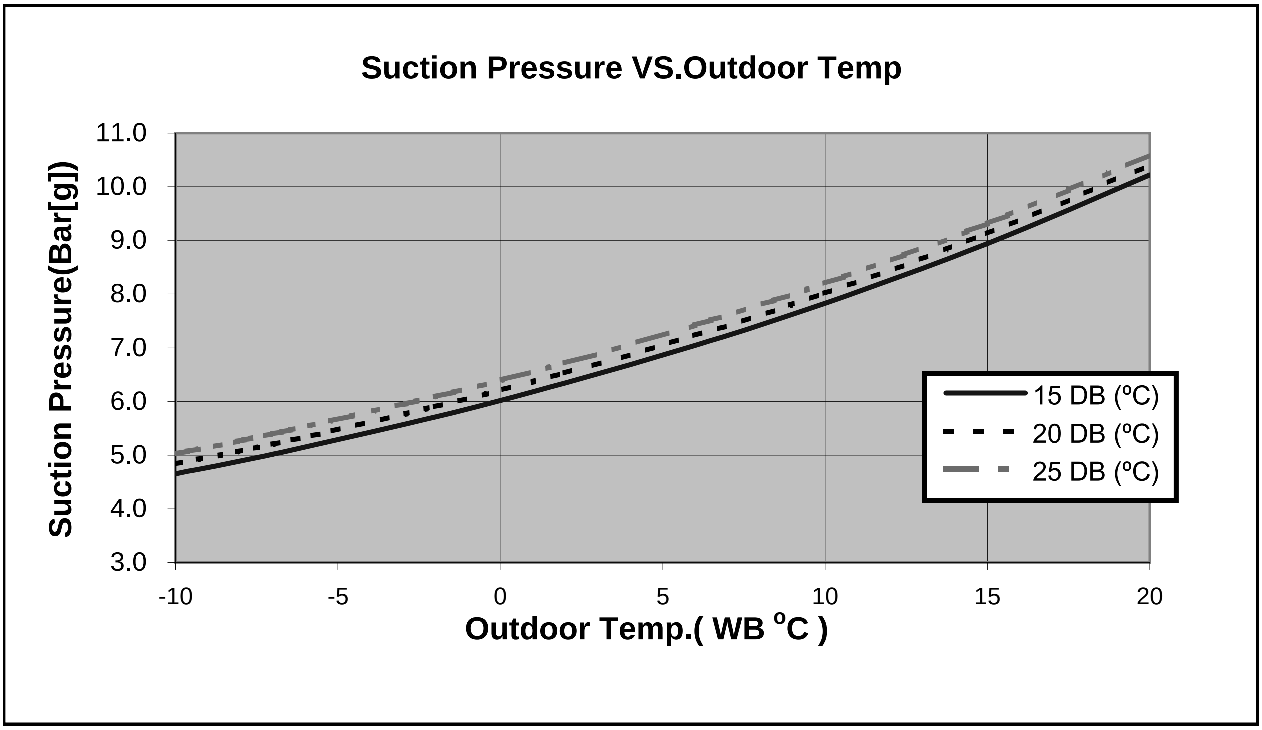
5.13.1 Cooling:





5.13.2 Heating.





5.14 CKF045 / GCN 47NT

5.14.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OD COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15(1)	TC	13.02	13.48	13.80	14.13	14.34
	SC	8.64	9.01	9.36	9.59	9.77
	PI	3.12	3.13	3.13	3.14	3.16
20(1)	TC	12.59	13.27	13.69	14.02	14.32
	SC	8.47	8.92	9.30	9.57	9.74
	PI	3.39	3.40	3.41	3.43	3.43
25	TC	11.92	12.87	13.53	13.94	14.28
	SC	8.25	8.75	9.23	9.50	9.67
	PI	3.66	3.69	3.71	3.73	3.76
30	TC	11.14	12.13	13.11	13.57	13.98
	SC	7.99	8.49	9.03	9.29	9.47
	PI	3.95	4.01	4.04	4.07	4.11
35	TC	10.32	11.20	**12.35**	12.97	13.58
	SC	7.60	8.14	**8.82**	9.08	9.25
	PI	4.26	4.33	**4.40**	4.43	4.46
40	TC	9.38	10.21	11.14	12.19	12.81
	SC	7.16	7.71	8.34	8.61	8.78
	PI	4.59	4.66	4.74	4.80	4.85
46	TC	8.14	8.90	9.79	10.81	11.65
	SC	6.60	7.07	7.61	7.87	8.05
	PI	5.02	5.09	5.21	5.28	5.34

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 15).

CONTENTS

5.14.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	5.30	2.88	5.10	3.07	4.90	3.22
-7	5.71	2.95	5.50	3.11	5.30	3.28
-2	6.06	2.99	5.86	3.17	5.66	3.35
2	7.37	3.13	7.07	3.33	6.77	3.53
6	10.40	3.37	10.10	3.60	9.75	3.82
10	11.31	3.55	11.01	3.80	10.71	4.06
15	12.22	3.71	11.92	4.00	11.62	4.25
20	12.88	3.82	12.57	4.14	12.22	4.46

* the above chart includes the weighted deicing infleuence.

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

5.15 Capacity Correction Factor Due to Tubing Length (One Way)

TOTAL TUBING LENGTH								
4m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.98	0.97	0.96	0.95	0.94	0.93	0.90

* Minimum recommended tubing length between indoor and outdoor units is 4m.

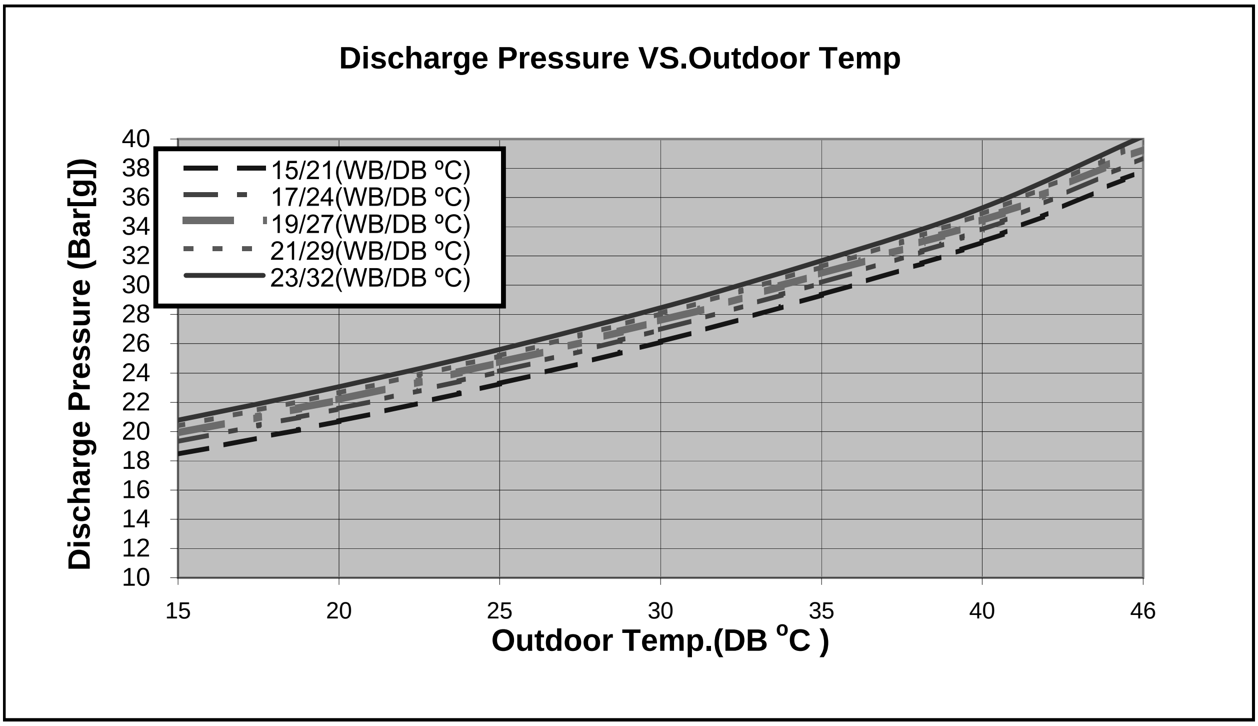
5.15.1 Heating

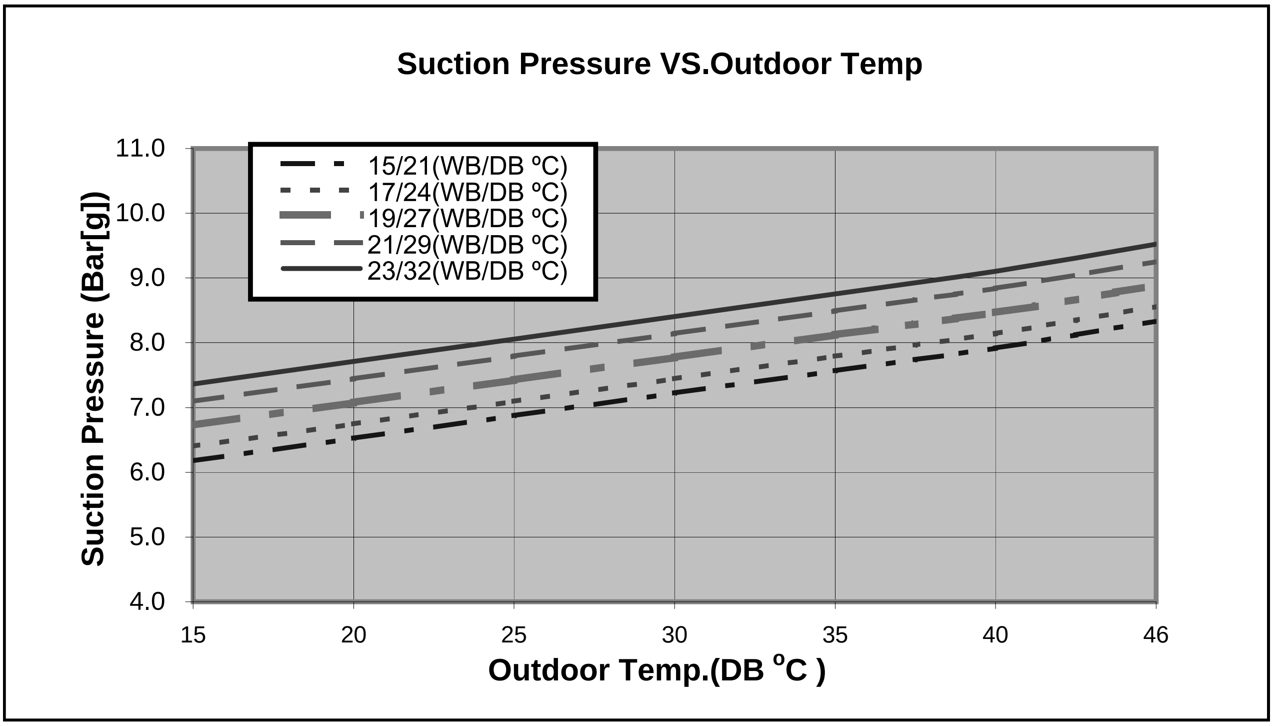
TOTAL TUBING LENGTH								
4m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.99	0.98	0.97	0.97	0.96	0.95

* Minimum recommended tubing length between indoor and outdoor units is 4m.

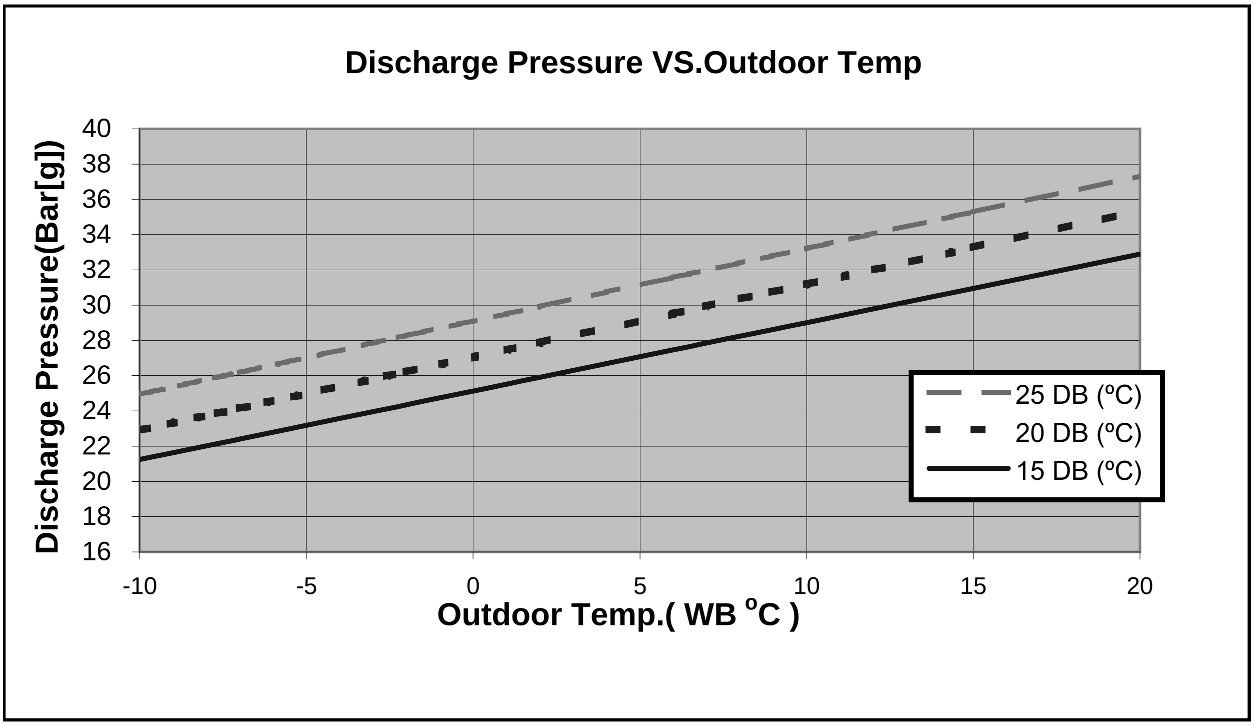
5.16 Pressure Curves.

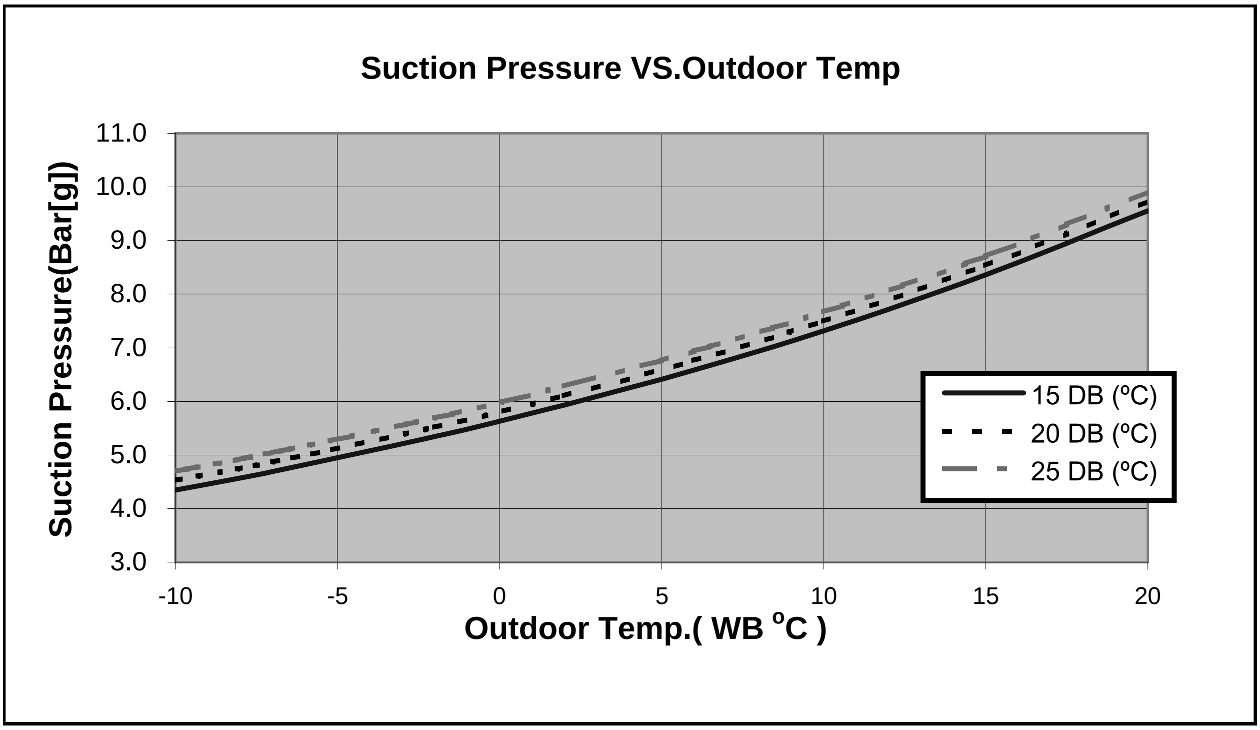
5.16.1 Cooling:





5.16.2 Heating





6. SOUND LEVEL CHARACTERISTICS

6.1 Sound Pressure Level

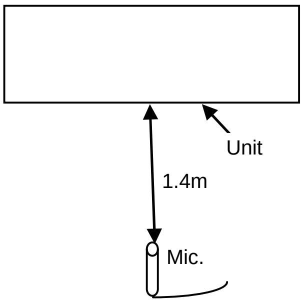
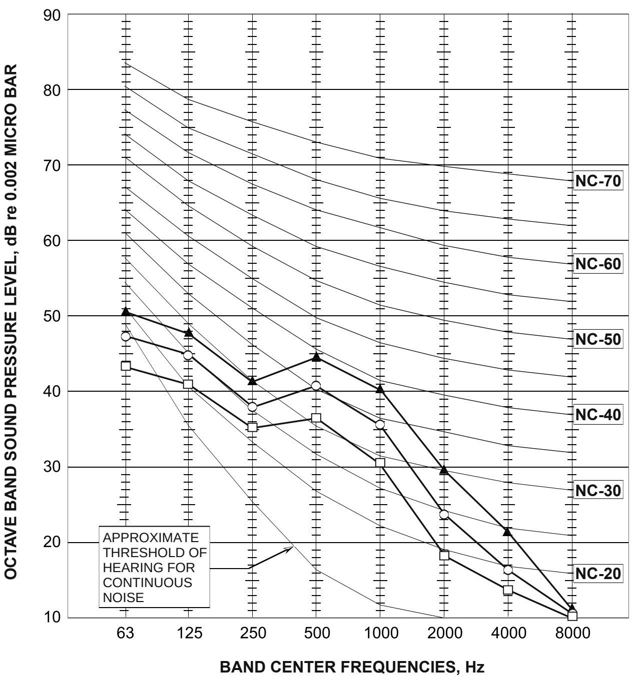


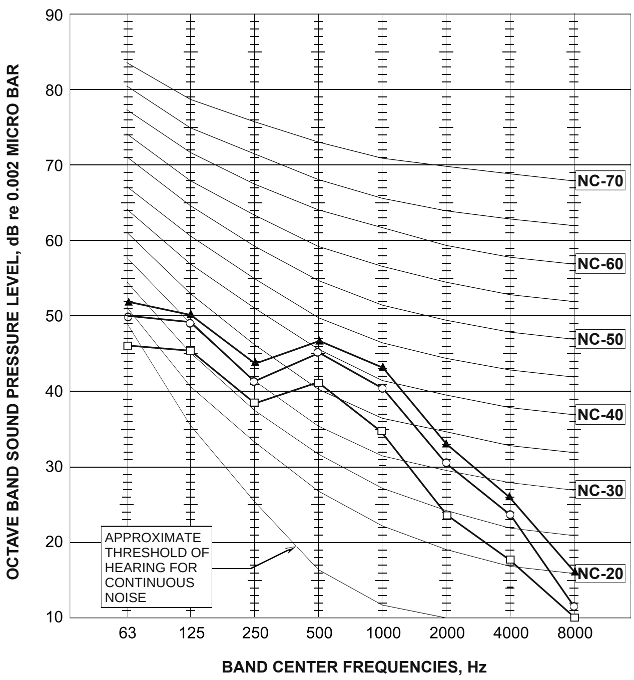
Figure 1

6.2 Sound Pressure Level Spectrum (Measured as Figure 1)

CKF024

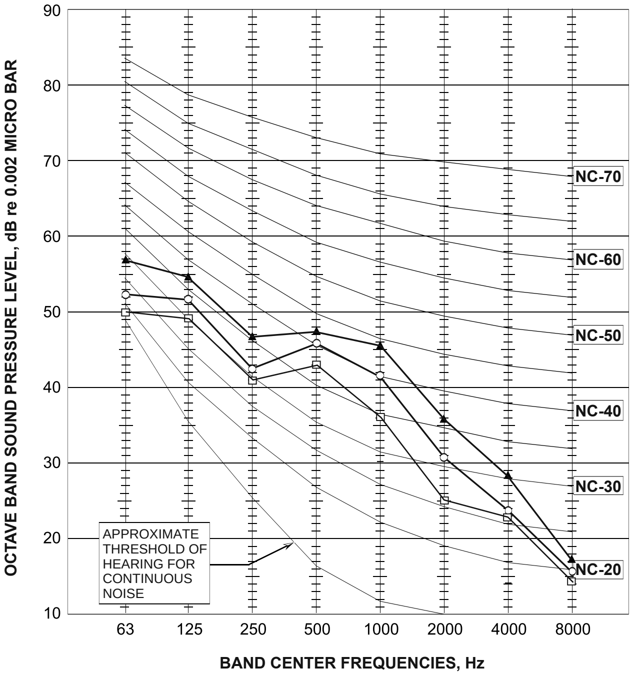


CKF030

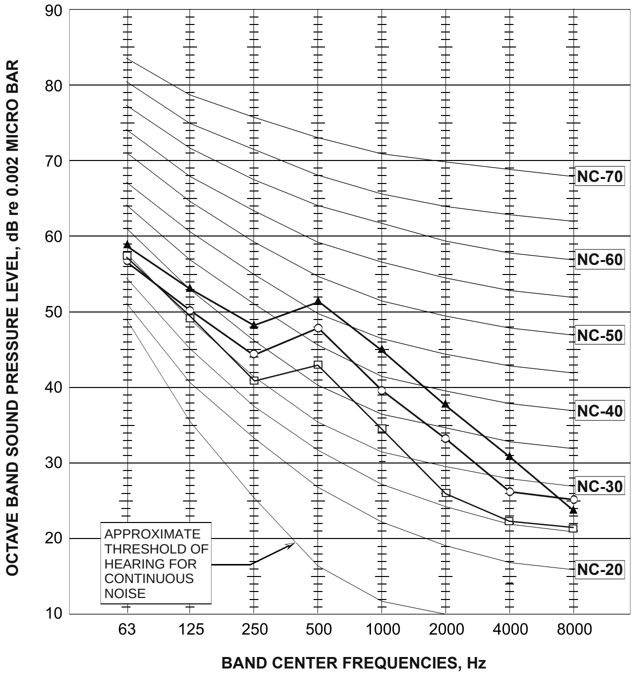


FAN SPEED	LINE
HI	—▲—
ME	—○—
LO	—□—

CKF036



CKF045



FAN SPEED	LINE
HI	—▲—
ME	—○—
LO	—□—

6.3 Outdoor units

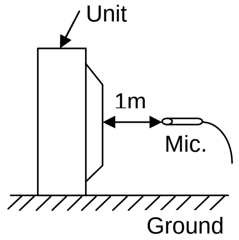
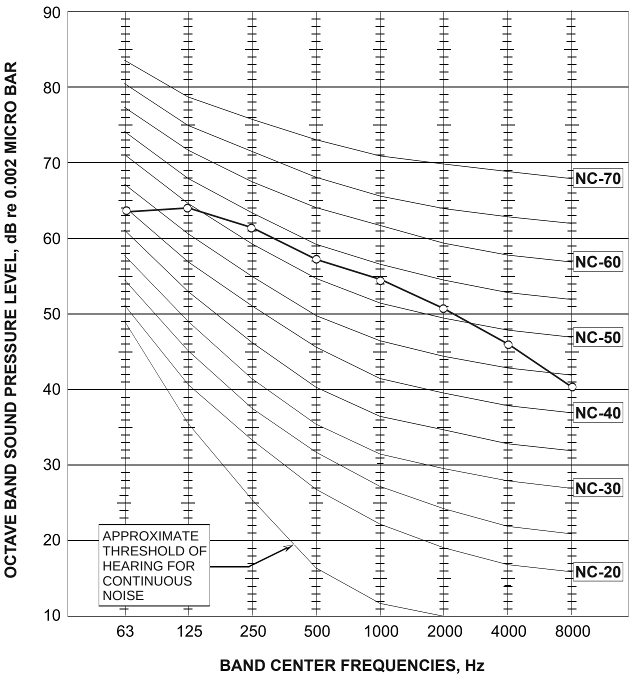


Figure 2

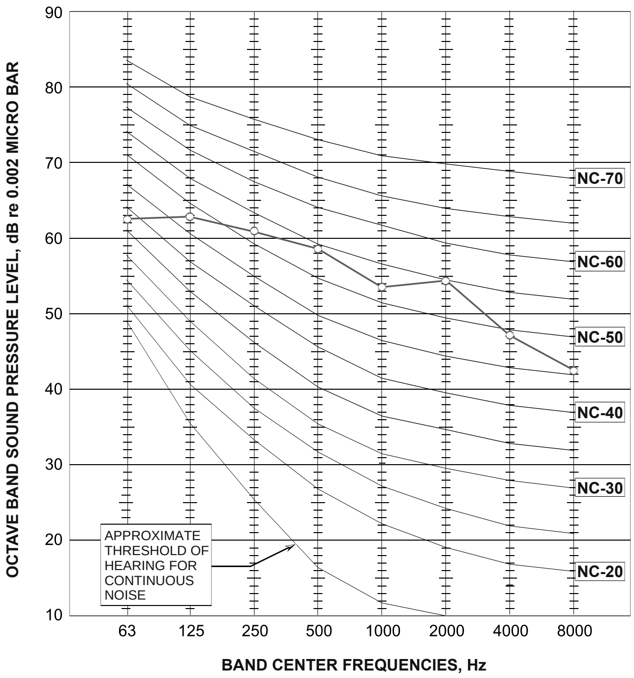
6.4 Sound Pressure Level Spectrum (Measured as Figure 2)

GCN 24 Cooling



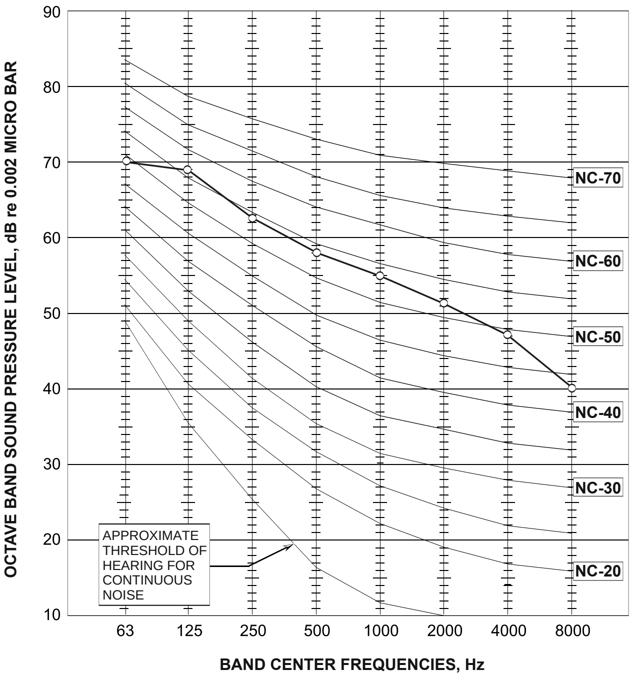
OU7-24 Cooling

GCN 24 Heating

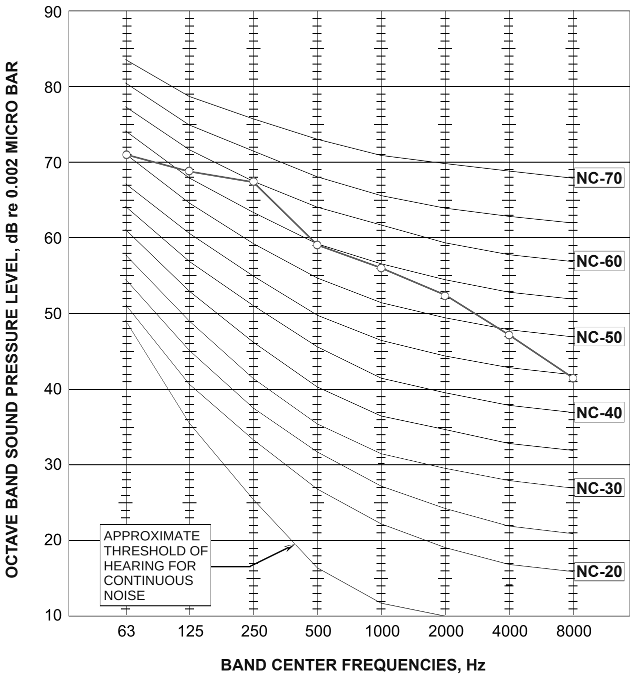


OU7-24 Heating

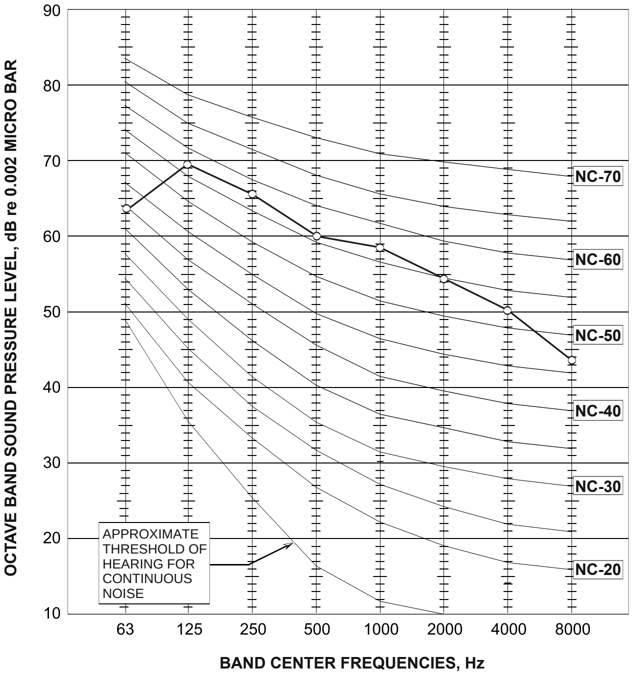
GCN 30Cooling



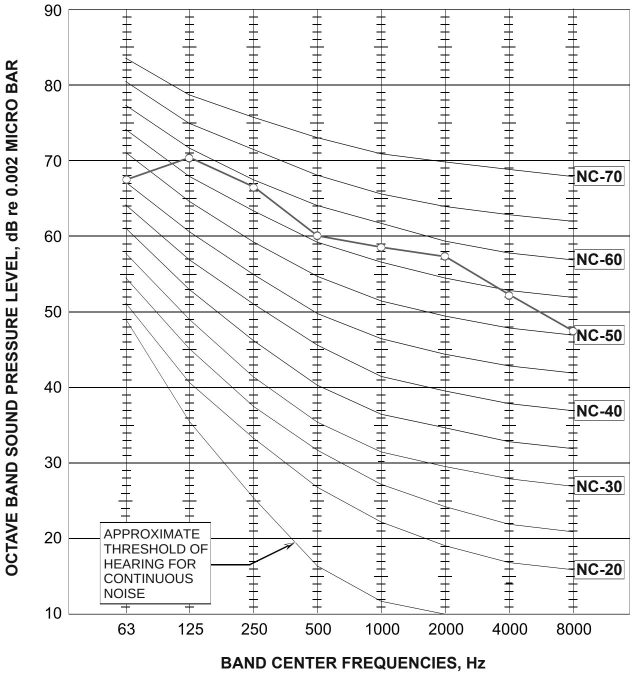
GCN 30 Heating



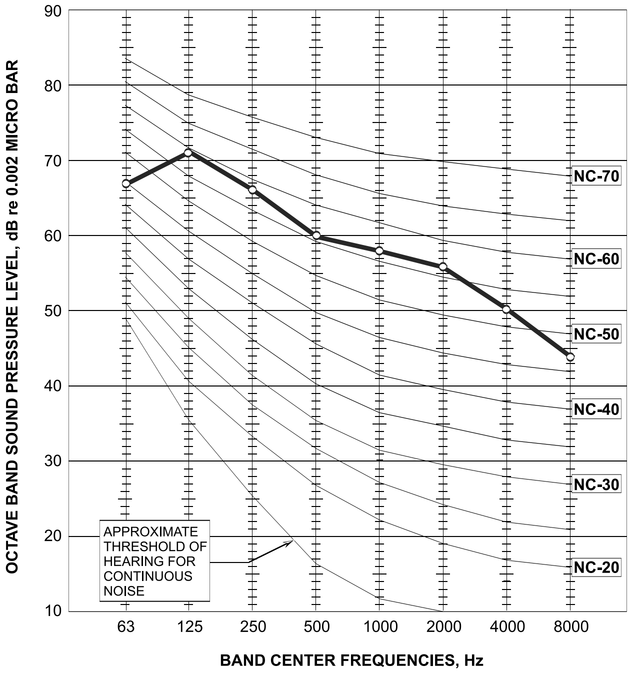
GCN 37 Cooling



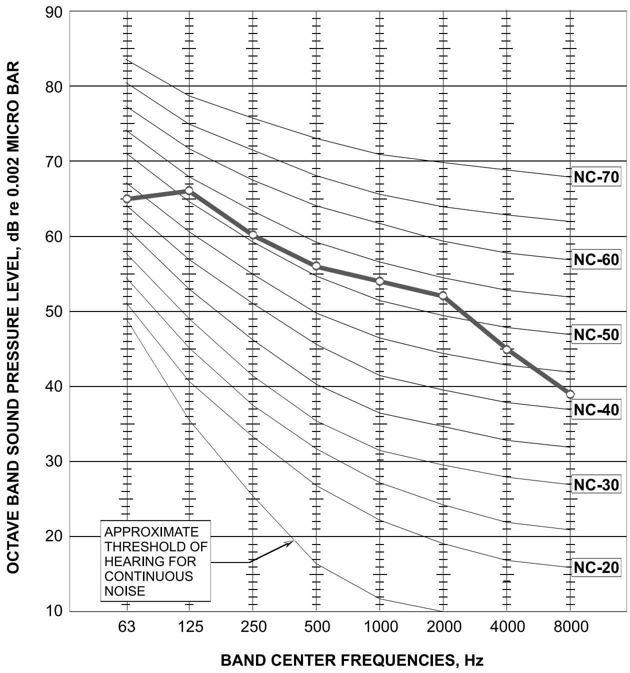
GCN 37 Heating



GCN 47 Cooling



GCN 47 Heating



Cooling **Heating**

7. ELECTRICAL DATA

7.1 Single Phase Units

MODEL	CKF024	CKF030
Power Supply	To Outdoor	To Outdoor
	1PH – 230V – 50 Hz	1PH – 230V – 50 Hz
Max Current, A	15	17
Circuit Breaker	20	25
Power Supply Wiring No. X Cross Section mm^2	3 X 2.5 mm^2	3 X 4 mm^2
Interconnecting Cable RC Model No. X Cross Section mm^2	6X1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm^2	5X1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)

MODEL	CKF036
Power Supply	To Outdoor
	1PH – 230V – 50 Hz
Max Current, A	22.4
Circuit Breaker	25
Power Supply Wiring No. X Cross Section mm^2	3 X 4 mm^2
Interconnecting Cable RC Model No. X Cross Section mm^2	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm^2	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)

7.2 Single Phase Units + Optional Heating Element

MODEL	CKF024	CKF030
Power Supply	To Outdoor	To Outdoor
	1PH – 230V – 50 Hz	1PH – 230V – 50 Hz
Heating Element, kW	2.1	2.7
Max Current, A	25.5	28
Circuit Breaker	32	32
Power Supply Wiring No. X Cross Section mm^2	3 X 4 mm^2	3 X 4 mm^2
Interconnecting Cable RC Model No. X Cross Section mm^2	6 X 2.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	6 X 2.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor
Interconnecting Cable ST Model No. X Cross Section mm^2	5 X 2.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	5 X 2.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)

7.3 Three Phase Units

MODEL	CKF024	CKF030
Power Supply	To Outdoor	To Outdoor
	3PH – 400V – 50 Hz	3PH – 400V – 50 Hz
Max Current, A	3 x 7.5	3 x 9.2
Circuit Breaker	3 x 10	3 x 16
Power Supply Wiring No. X Cross Section mm^2	5 X 1.5 mm^2	5 X 1.5 mm^2
Interconnecting Cable RC Model No. X Cross Section mm^2	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm^2	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)

MODEL	CKF036	CKF045
Power Supply	To Outdoor	To Outdoor
	3PH – 400V – 50 Hz	3PH – 400V – 50 Hz
Max Current, A	3 x 11.9	3 x 17.5
Circuit Breaker	3 x 16	3 x 20
Power Supply Wiring No. X Cross Section mm^2	5 X 2.5 mm^2	5 X 2.5 mm^2
Interconnecting Cable RC Model No. X Cross Section mm^2	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm^2	5 X 2.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)

7.4 Three Phase Units + Optional Heating Element

MODEL	CKF024	CKF030
Power Supply	To Outdoor	To Outdoor
	3PH – 400V – 50 Hz	3PH – 400V – 50 Hz
Heating Element, kW	2.1	2.7
Max Current, A	3 X 10.1	3 X 14.6
Circuit Breaker	3 X 16	3 X 16
Power Supply Wiring No. X Cross Section mm^2	5 X 1.5 mm^2	5 X 2.5 mm^2
Interconnecting Cable RC Model No. X Cross Section mm^2	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor
Interconnecting Cable ST Model No. X Cross Section mm^2	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)

MODEL	CKF036	CKF045
Power Supply	To Outdoor	To Outdoor
	3PH – 400V – 50 Hz	3PH – 400V – 50 Hz
Heating Element, kW	3.0	3.0
Max Current, A	3 X 17.2	3 X 21.9
Circuit Breaker	3 X 20	3 X 25
Power Supply Wiring No. X Cross Section mm^2	5 X 2.5 mm^2	5 X 2.5 mm^2
Interconnecting Cable RC Model No. X Cross Section mm^2	8 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	8 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor
Interconnecting Cable ST Model No. X Cross Section mm^2	7 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	7 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)

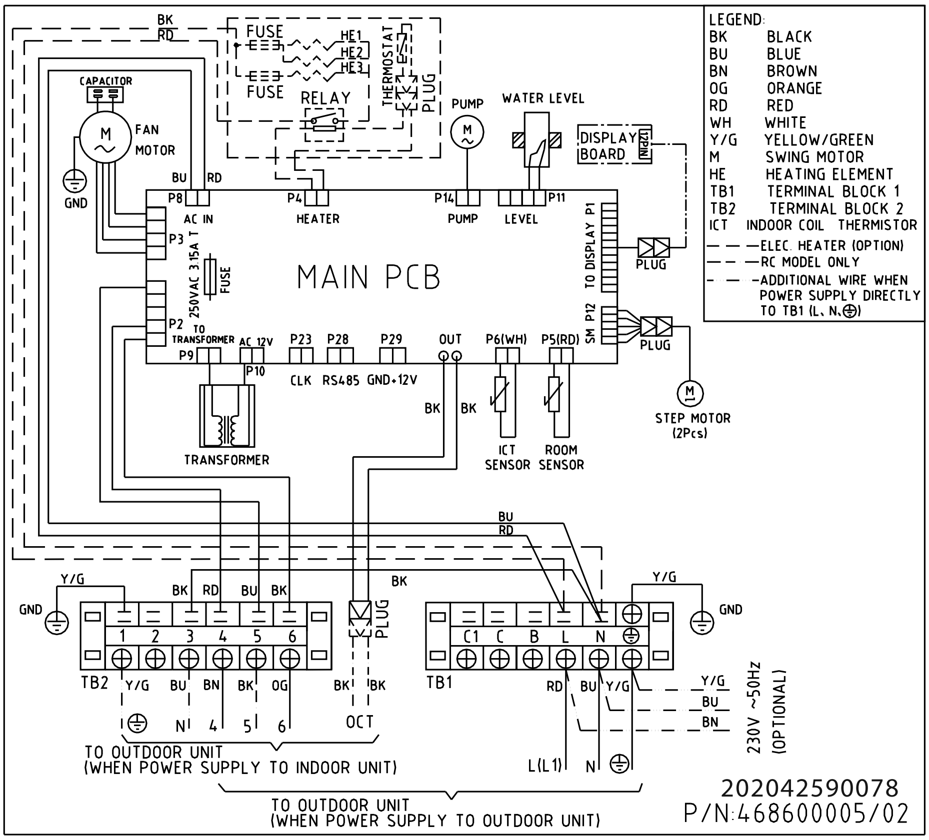
(1) The power supply to the heating element kit is provided separately from the main power supply unit.

NOTE

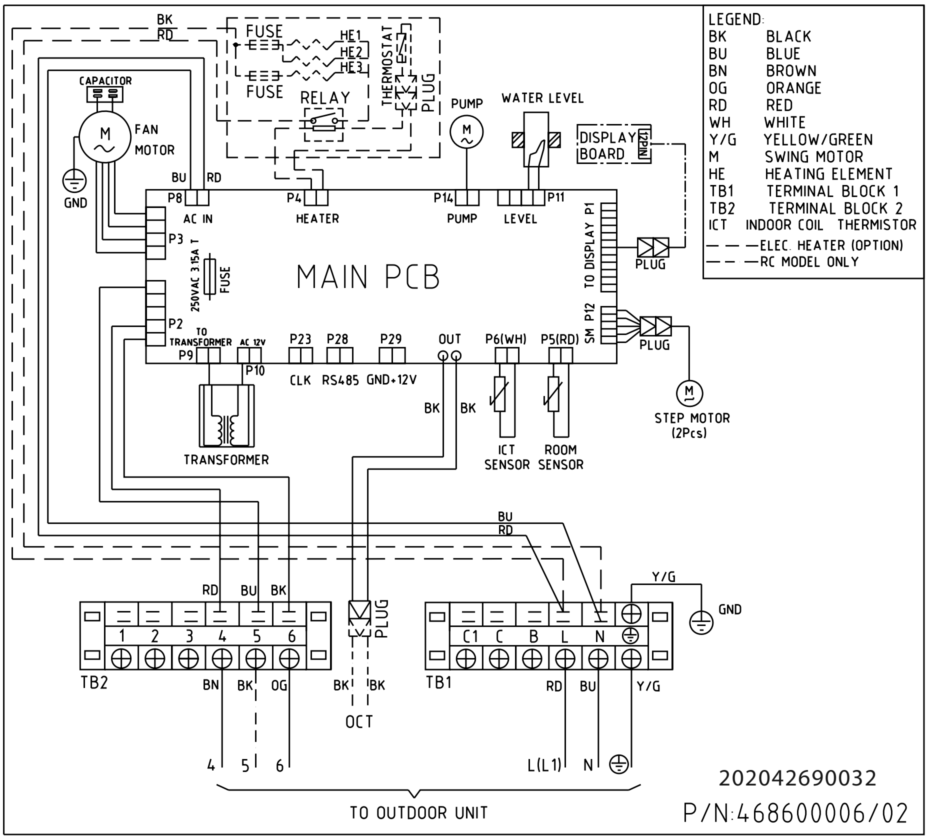
Power wiring cord should comply with local lows and electrical regulations requirements.

8. WIRING DIAGRAMS

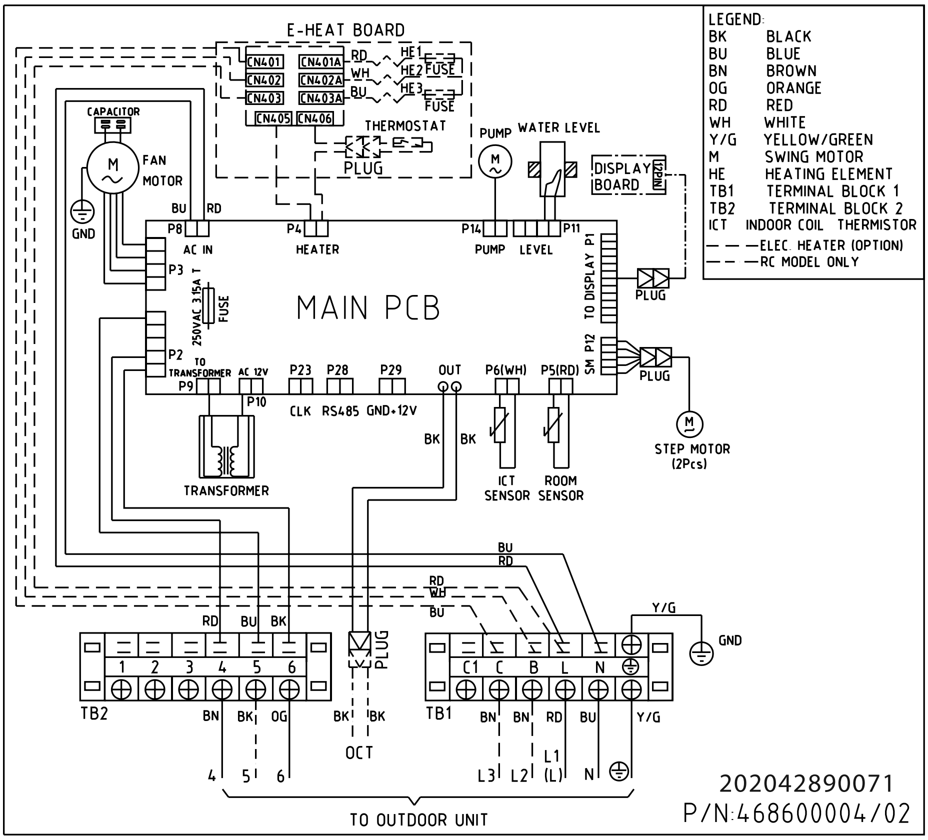
8.1 Indoor Unit: CKF024



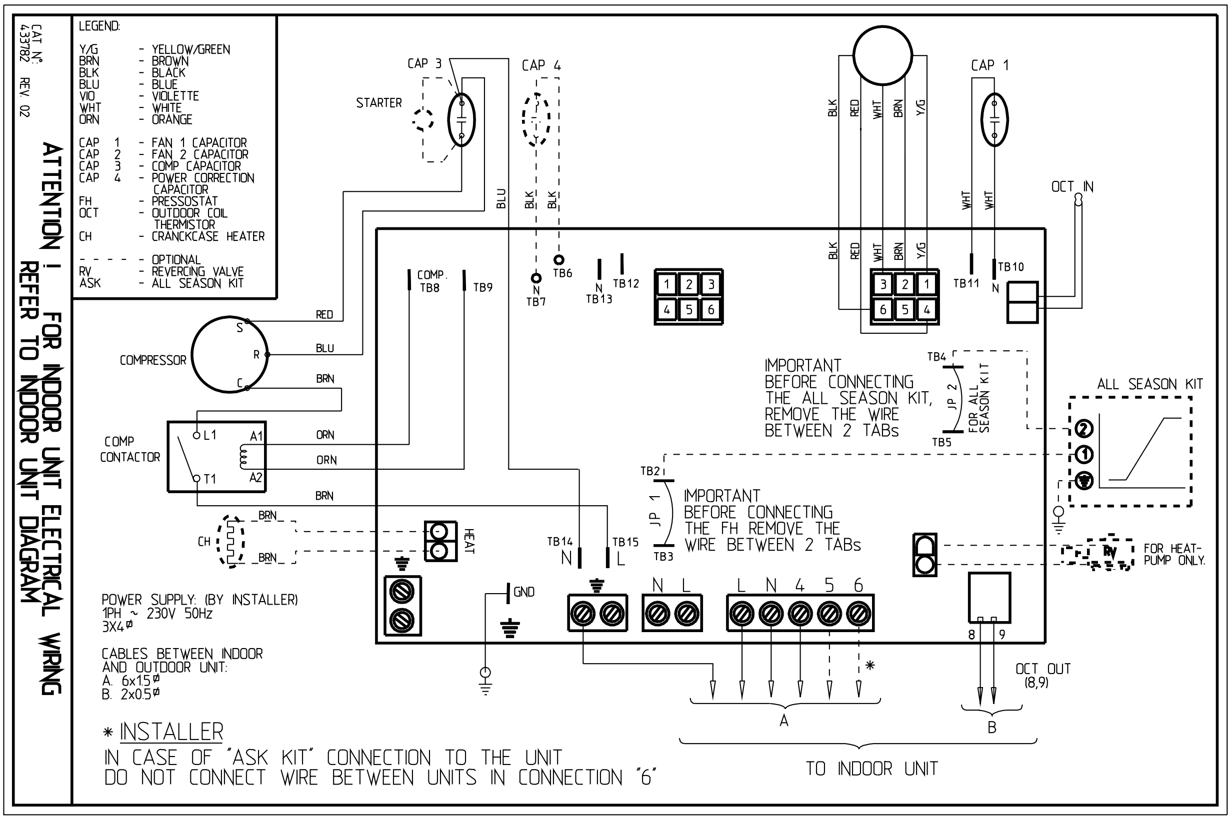
8.2 Indoor Unit: CKF030



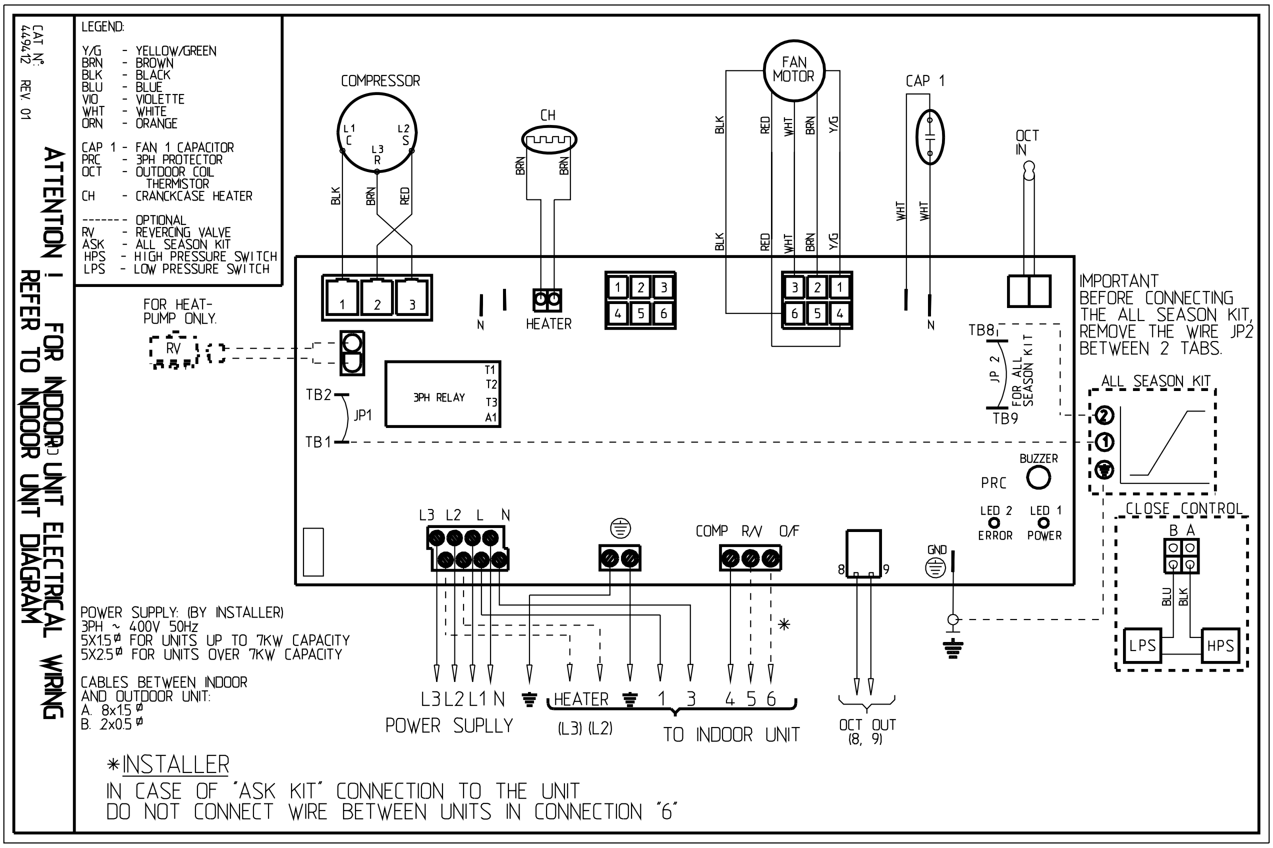
8.3 Indoor Unit: CKF036 / CKF045



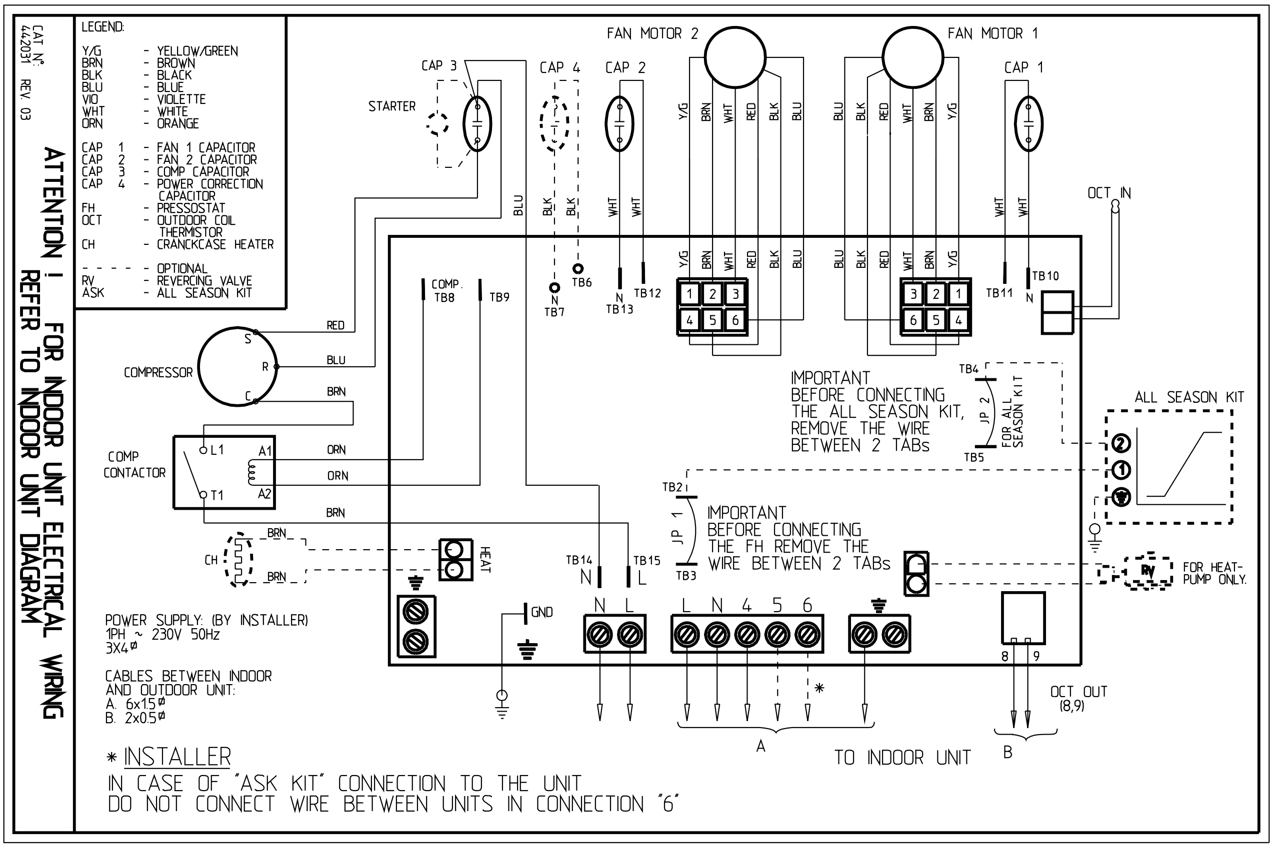
8.4 Outdoor Unit: GCN 24 / GCN 30N



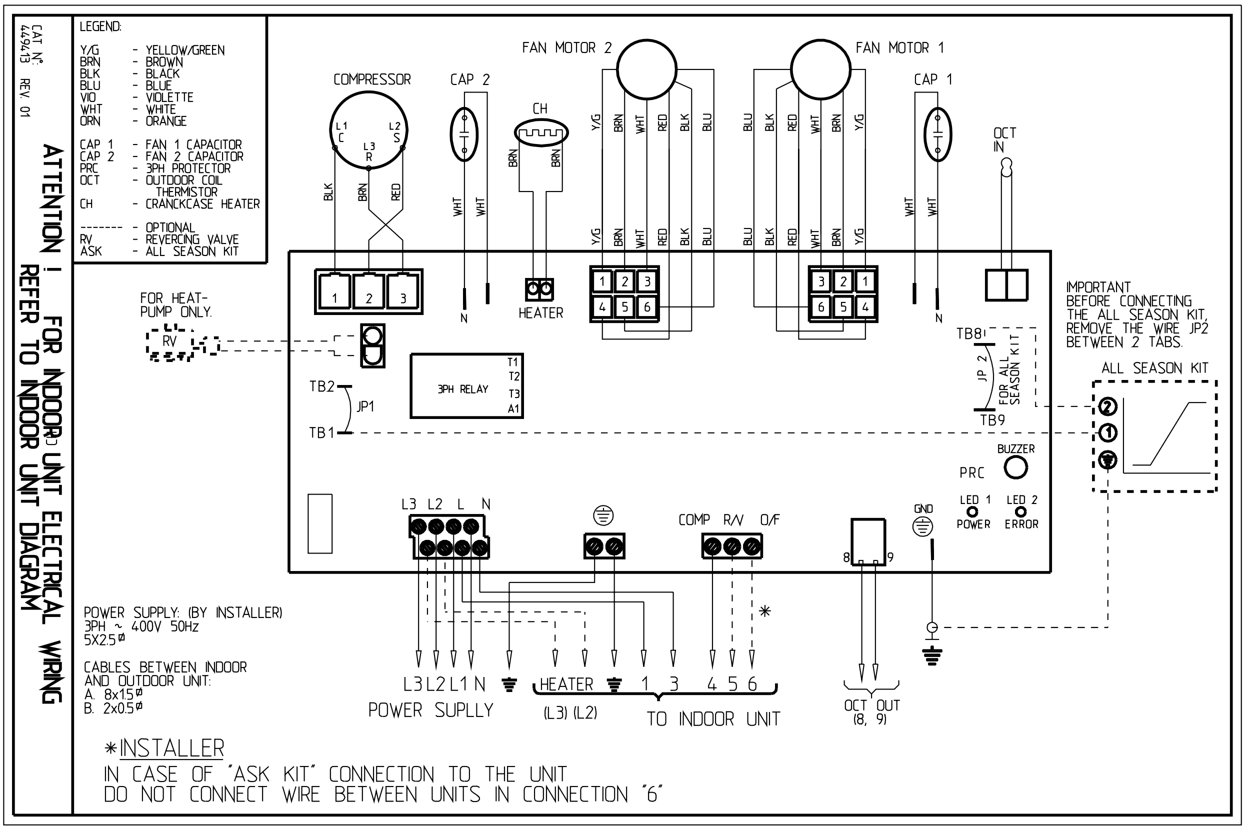
8.5 Outdoor Unit: GCN 24T / GCN 30NT



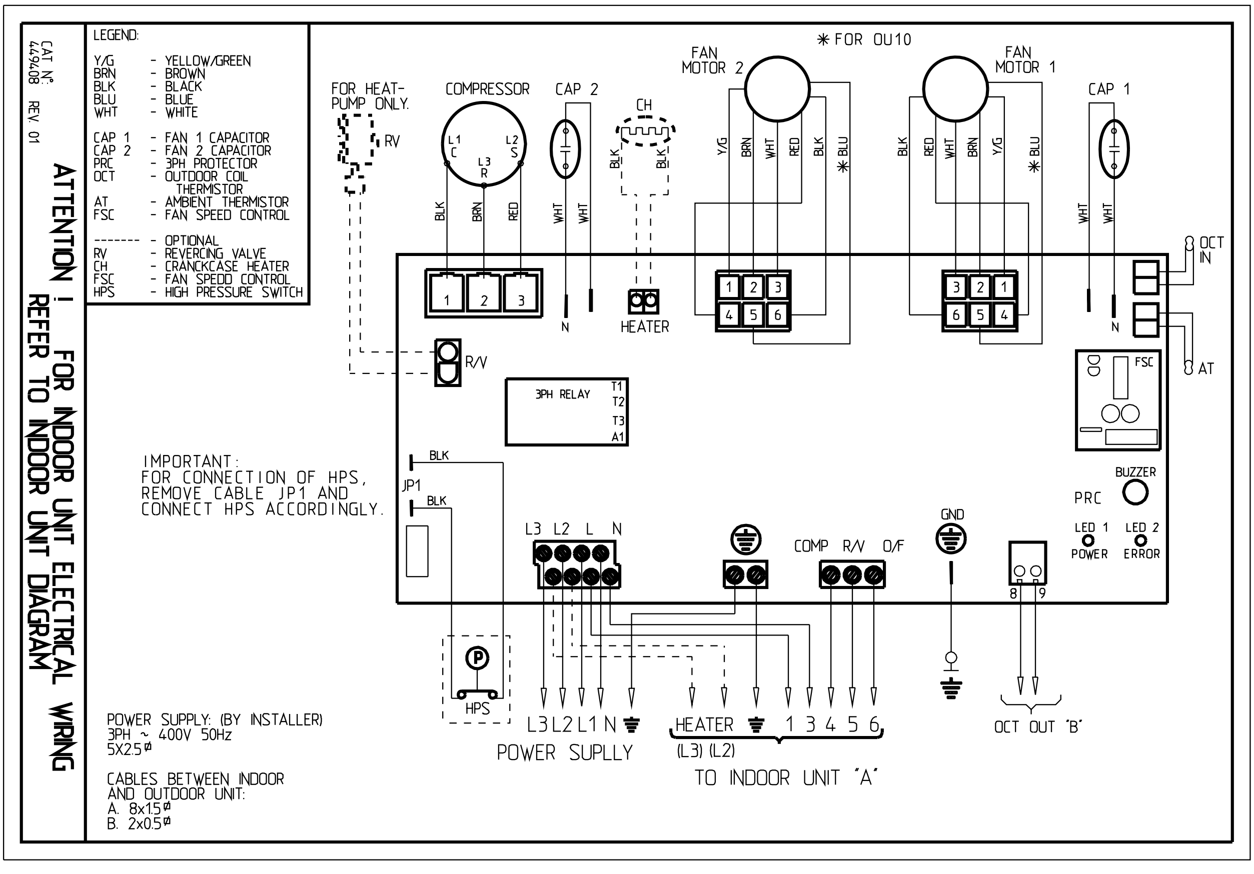
8.6 Outdoor Unit: GCN 37N



8.7 Outdoor Unit: GCN 37NT

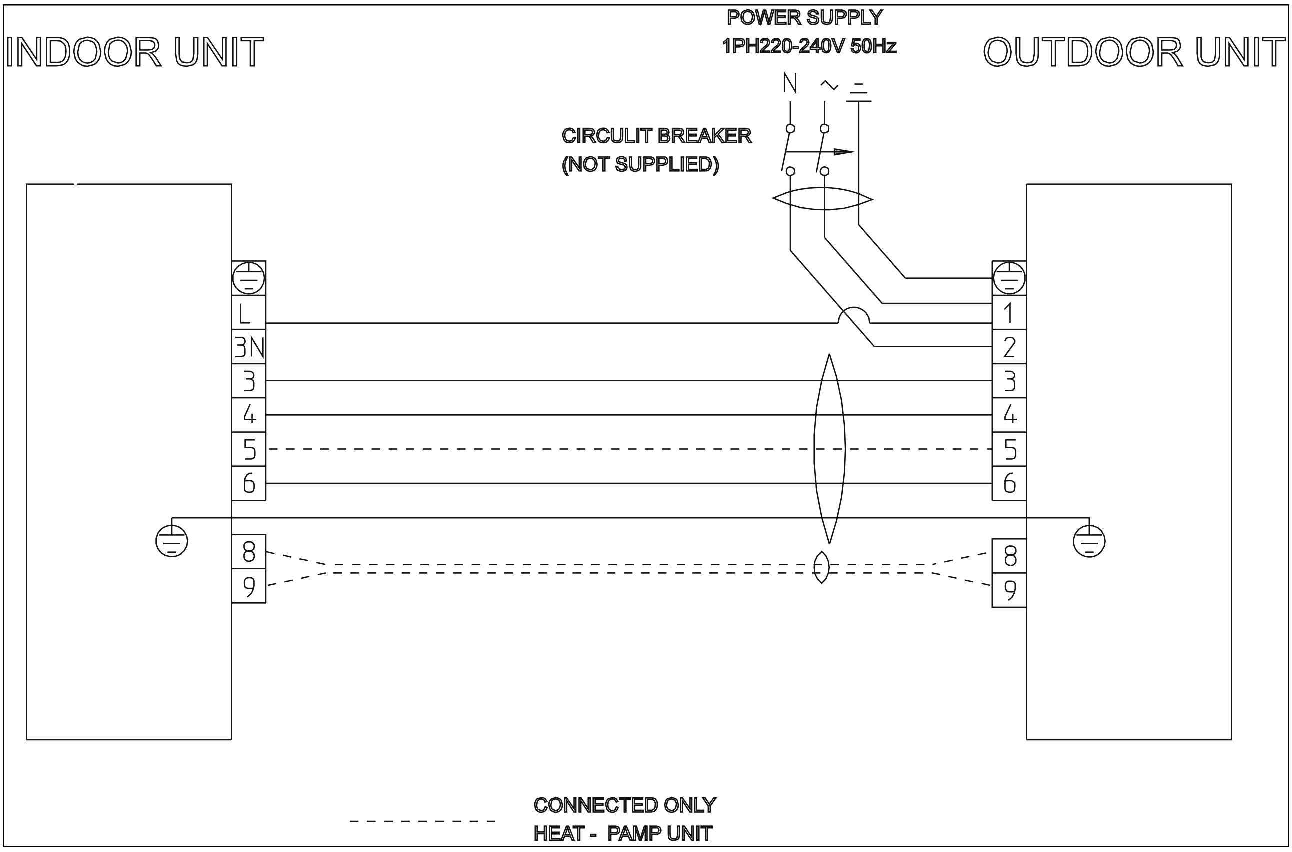


8.8 Outdoor Unit: GCN 47NT

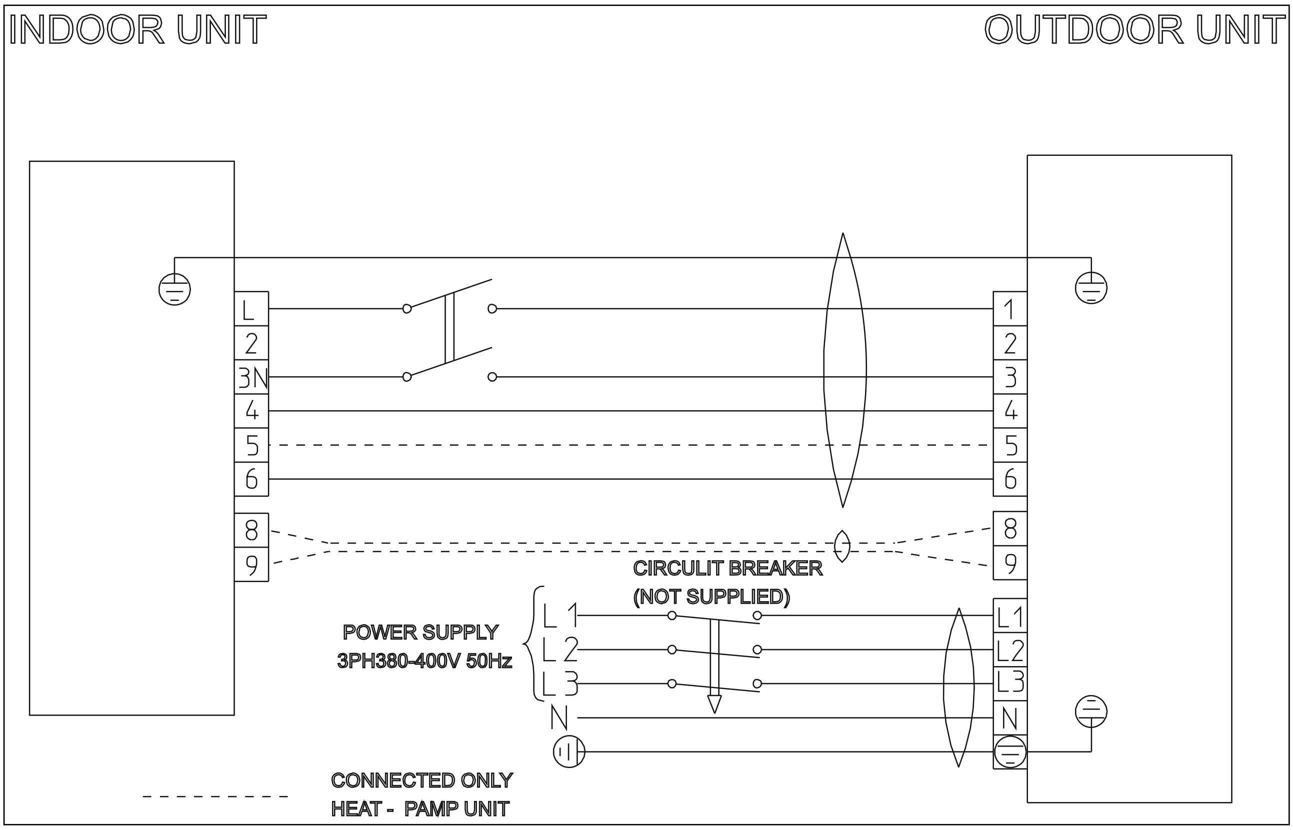


9. ELECTRICAL CONNECTIONS

9.1 SKF024, CKF030, CKF036 1PH (Power Supply to Outdoor)



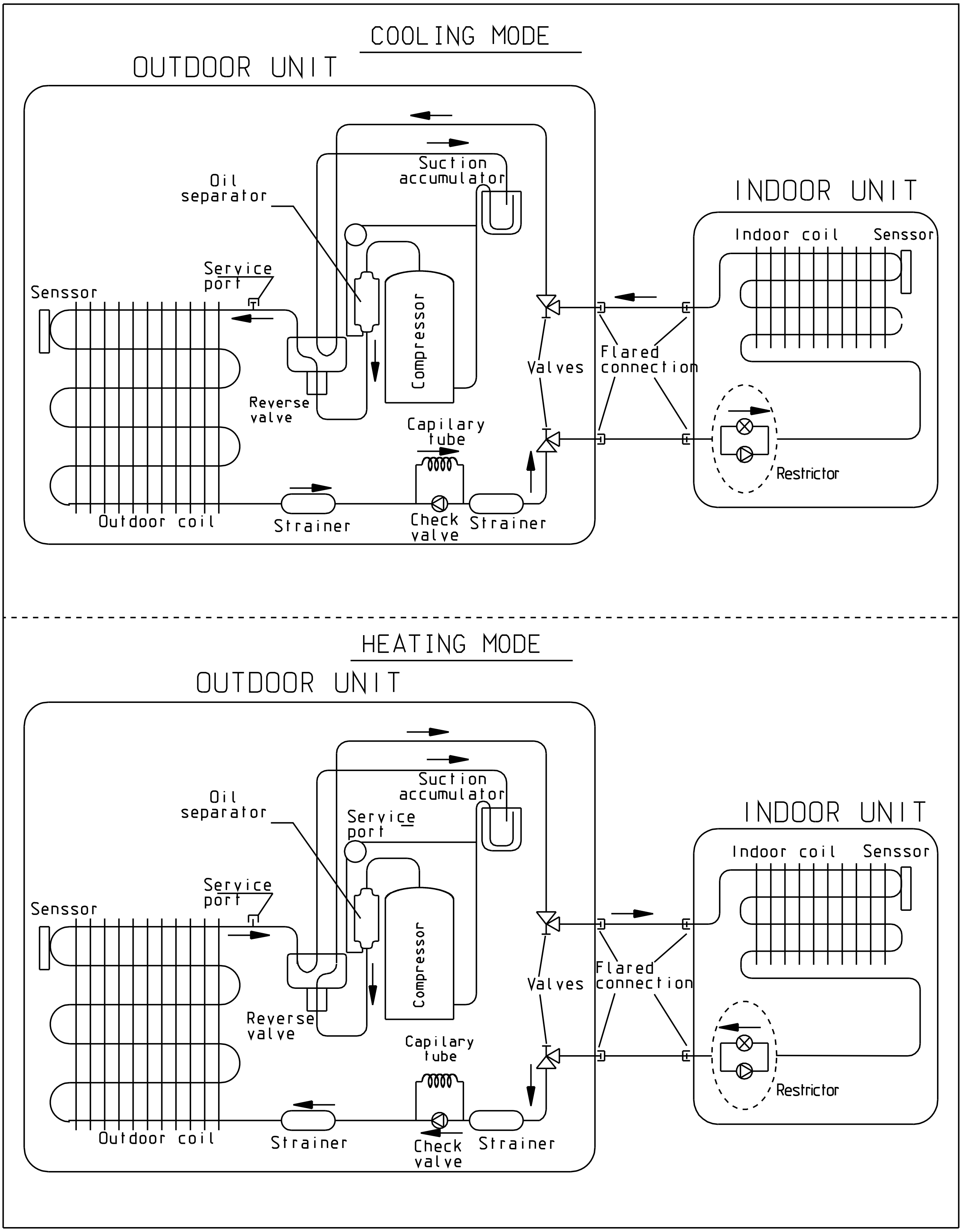
9.2 CKFO24, CKF030, CKF036, CKF045 3PH (Power Supply to Outdoor)



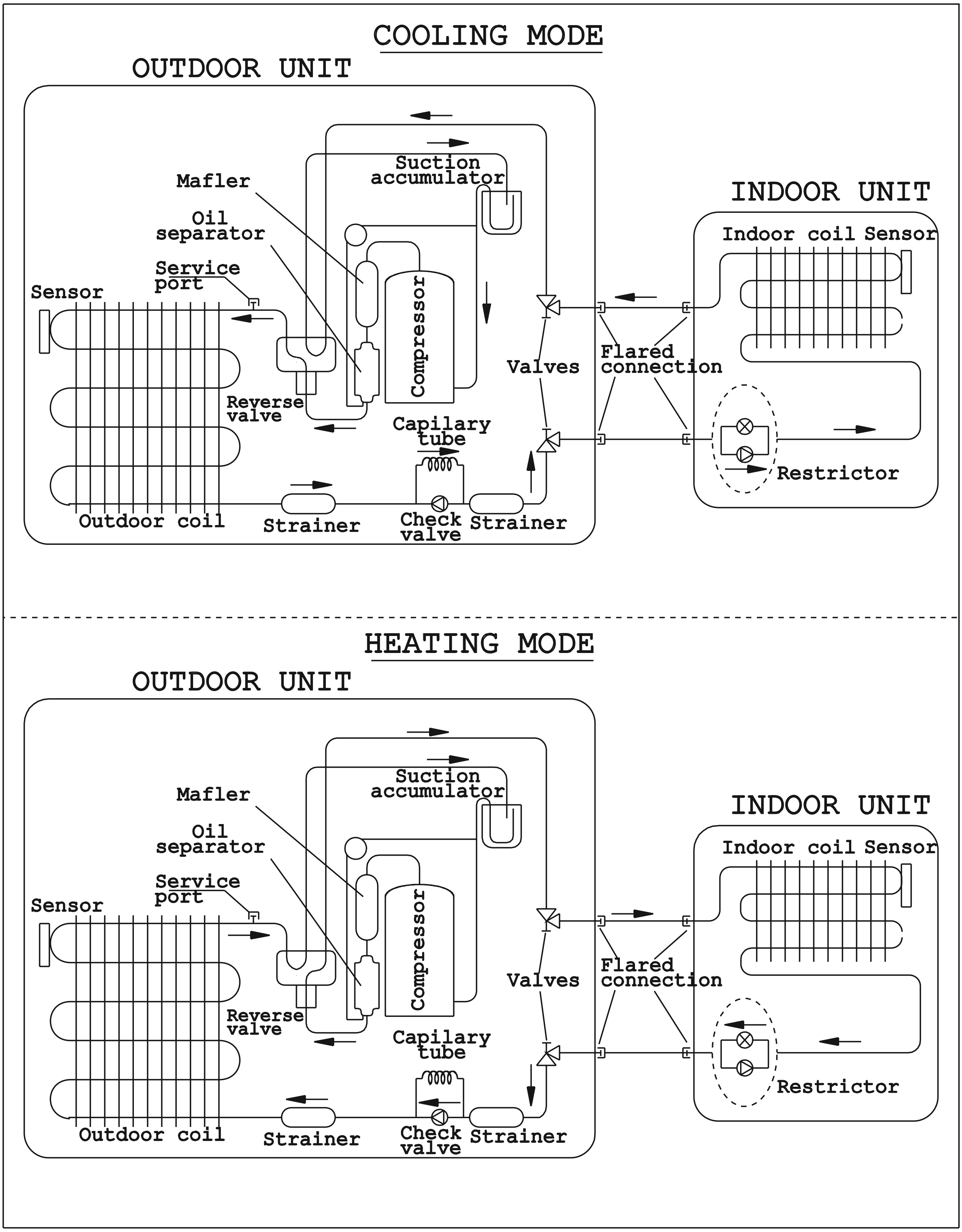
10. REFRIGERATION DIAGRAMS

10.1 Heat Pump Models

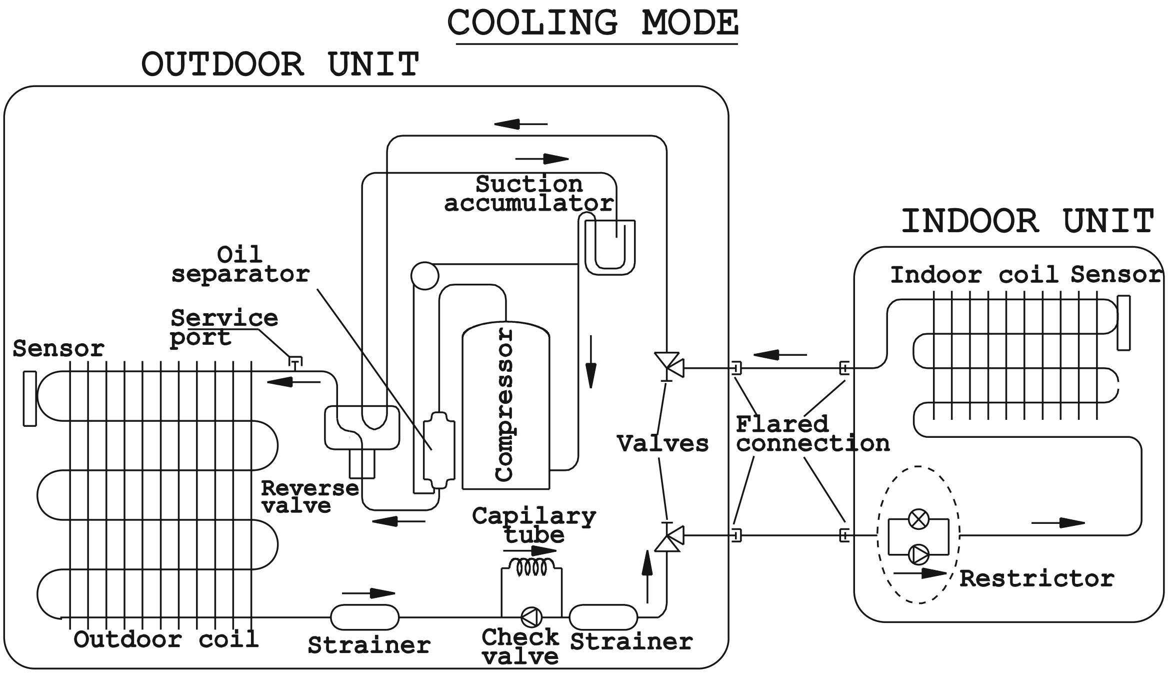
10.1.1 CKF024

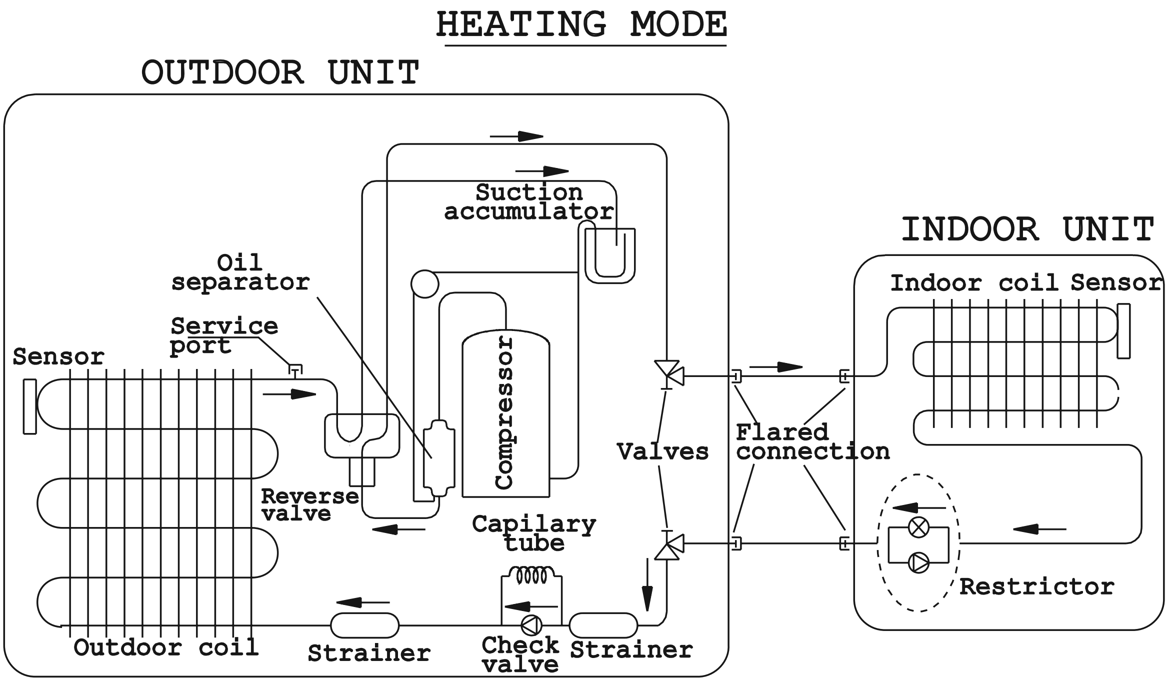


10.1.2 CKF030, CKF036



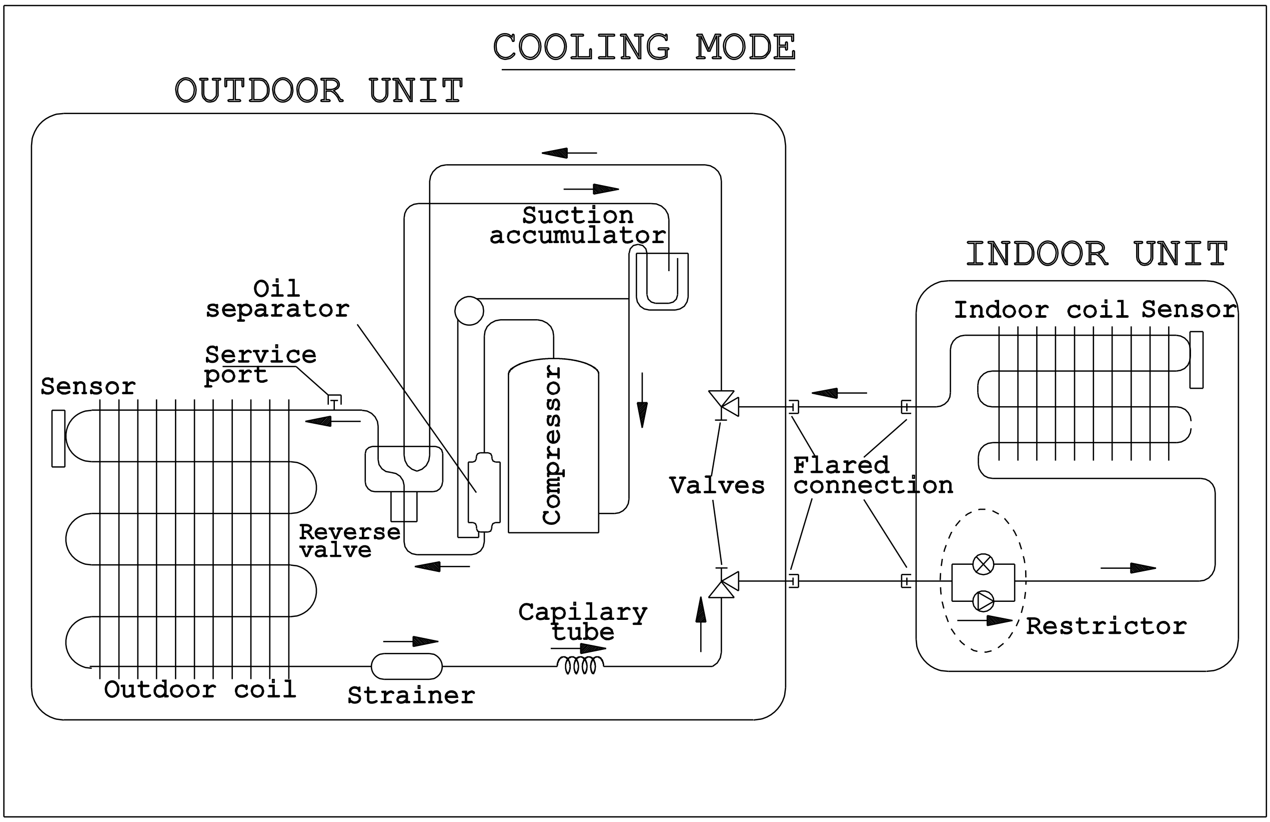
10.1.3 CKF045


COOLING MODE
OUTDOOR UNIT
INDOOR UNIT
Suction accumulator
Oil separator
Service port
Sensor
Compressor
Valves
Flared connection
Indoor coil
Sensor
Reverse valve
Capilary tube
Restrictor
Outdoor coil
Strainer
Check valve
Strainer


HEATING MODE
OUTDOOR UNIT
INDOOR UNIT
Suction accumulator
Oil separator
Service port
Sensor
Compressor
Valves
Flared connection
Indoor coil
Sensor
Reverse valve
Capilary tube
Restrictor
Outdoor coil
Strainer
Check valve
Strainer

10.2 Cooling Only Models

10.2.1 CKF024, CKF030, CKF036, CKF045



11. CONTROL SYSTEM

11.1 Electronic Control

11.1.1 Introduction

The electronic control information is designed for service applications, and is common to the following groups of air-conditioners:

- **ST/RC** group -Cooling only / cooling and heating by heat pump.
- **SH group** -Cooling and heating by heat pump and supplementary heater.
- **RH group** -Cooling, heating by heaters only.

11.1.2 Remote Control DIP Switch Settings

SETTING SWITCH STATUS				DEFINITION	
SW. NO. 1	SW. NO. 2	SW. NO. 3	SW. NO. 4	RC3	RC4
OFF	OFF	--	--	RC-ALL MODES OF OPERATION	
ON	OFF	--	--	STD-COOL, FAN, DRY, ACTIVE	
OFF	ON	--	--	HEAT-COOL, FAN, DRY, ACTIVE	
ON	ON	--	--	AUTO FAN (AF)	
--	--	OFF	--	TEMP. DISPLAY IN °C DEGREES	VERTICAL SWING ONLY
--	--	ON	--	TEMP. DISPLAY IN °F DEGREES	HORIZONTAL & VERTICAL SWING FUNCTIONS TOGETHER
--	--	--	OFF	TIMER & CLOCK 12H AM, PM	DISABLE LCD & KEY ILLUMINATION
--	--	--	ON	TIMER & CLOCK 24H	ENABLE LCD & KEY ILLUMINATION

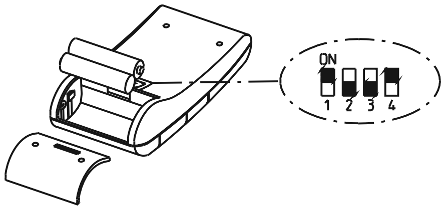
Reset operation **-** Press the 4 buttons simultaneously: “CLEAR “, “SET”, "HR +”, ”HR -” for 5 seconds

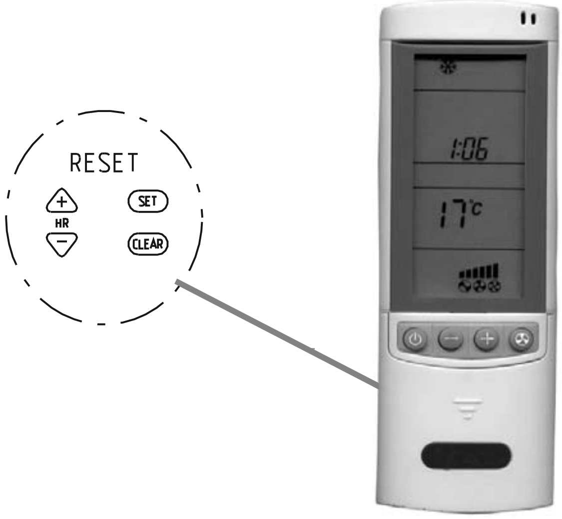
<u>**LEGEND**</u>

SW1, SW2 - Selection of RC/ST
SW3 – Selection of Display °C or °F in RC3 or swing function in RC4
SW4 – Selection of Time Display 12H AM/PM or 24H in RC3 or illumination in RC4
OFF = 0
ON = 1

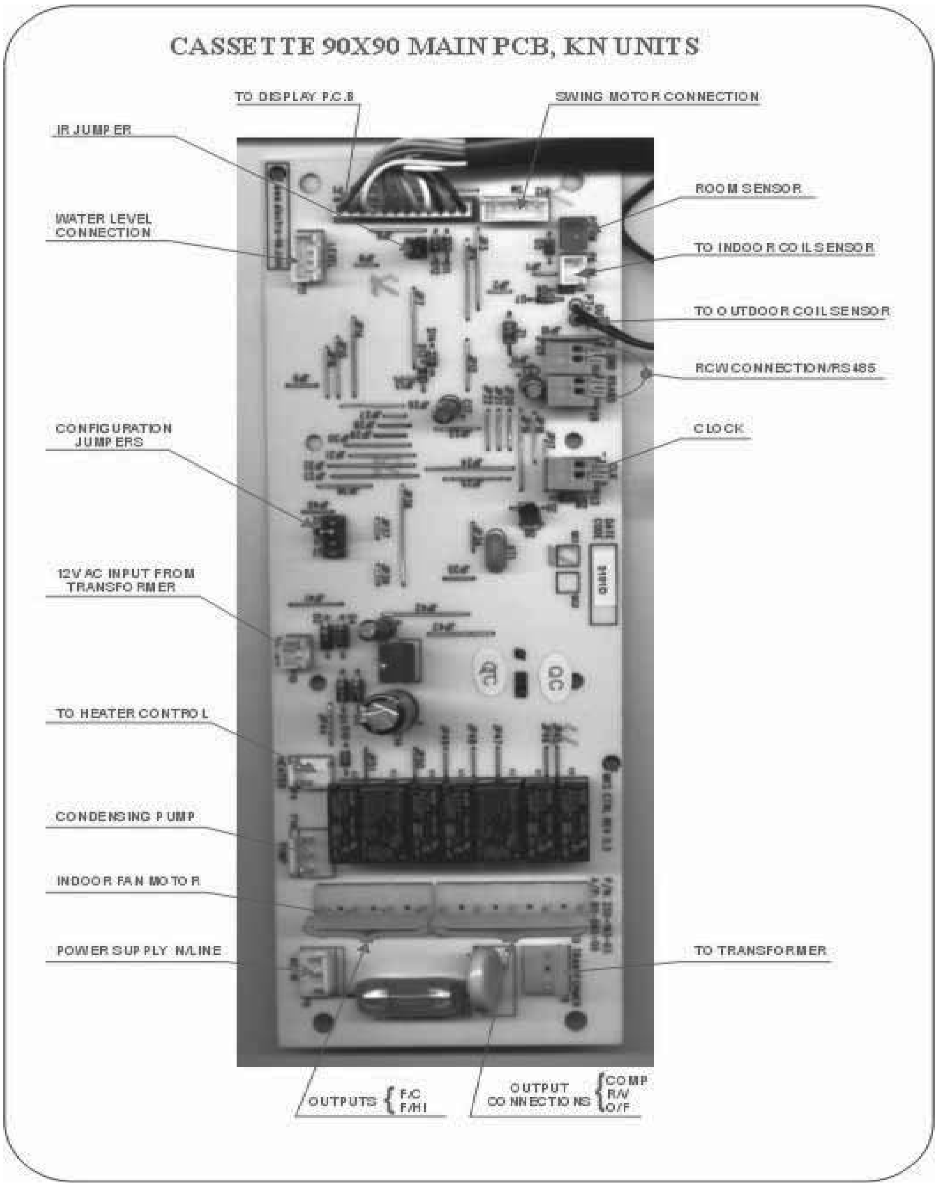
NOTE

After setting the DIP switches perform reset operation.

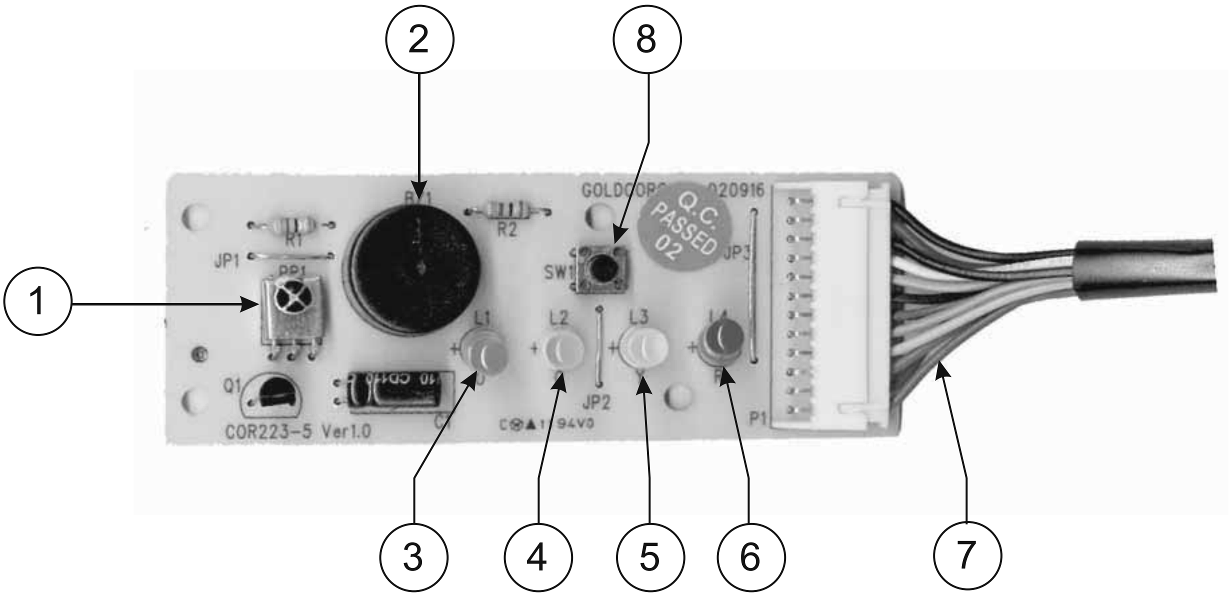




11.1.3 Main PCB Controller



11.1.4 Display Board PCB



Legend

1. IR Receiver
2. Buzzer
3. STBY LED
4. Operation LED
5. Timer LED
6. Heating LED
7. Display Port Connection
8. Push Button (Mode)

11.2 Control Function

11.2.1 Abbreviations

AC	- Alternate Current
A/C	- Air-Conditioner
ANY	- ON or OFF status
CLOCK	- ON/OFF Operation Input, (dry contact)
COMP	- Compressor
CPU	- Central Processing Unit
CTV	- Compensation Temperature Value
HE	- Heating Element
HPC	- High Pressure Control
H/W	- Hardware
ICP	- Indoor Condensation Pump
ICT	- Indoor Coil Temperature (RT2) sensor
IF, IFAN	- Indoor Fan
IR	- Infrared
LEVEL1	- Normal Water Level
LEVEL2/3	- Medium/High Waterlevel
LEVEL4	- Overflow Level
Max	- Maximum
Min	- Minimum
min	- Minute (time)
NA	- Not Applicable
OCP	- Outdoor Condensation Pump
OCT	- Outdoor Coil Temperature (RT3) sensor
OF, OFAN	- Outdoor Fan
OPER	- Operate
Para.	- Paragraph
RAT	- Return Air Temperature (RT1) sensor
RC	- Reverse Cycle (Heat Pump)
R/C	- Remote Control
RCT	- Remote Control Temperature
RH	- Resistance Heater
RT	- Room Temperature (i.e. RCT in IFEEL mode, RAT otherwise)
RV	- Reversing Valve
SB, STBY	- Stand-By
sec	- Second (time)
Sect	- Section
SH	- Supplementary Heater
SPT	- Set Point Temperature
ST	- Standard (Model with Cooling Only)
S/W	- Software
TEMP	- Temperature
W/O	- Without
ΔT	- The difference between SPT and RT. in Heat Mode: $\Delta T = SPT - RT$ in Cool/Dry/Fan Mode: $\Delta T = RT - SPT$

11.3 General Functions

11.3.1 COMP Operation

a. For each Mode including POWER OFF & SB, a Min time delay of 3 min before COMP restarting, excluding DEICING Mode.

b. The Min operation time of COMP under different operating conditions is:

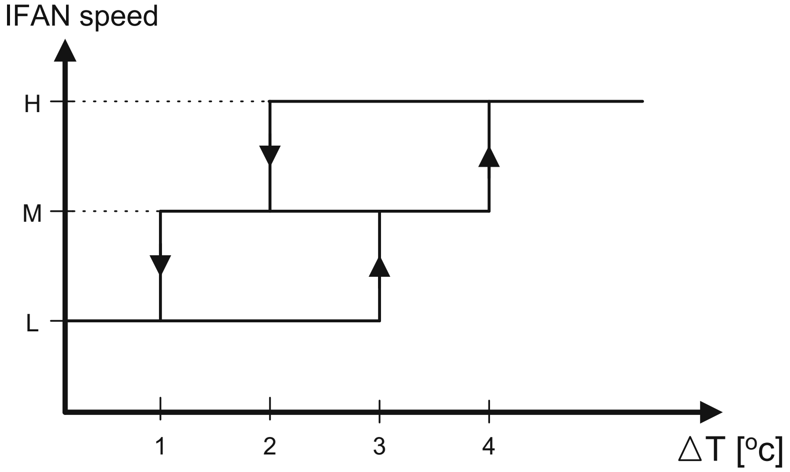
Operation Mode	Min Operation Time of COMP
Heat, Cool, HP protection or Auto Modes	3 min.
Fan, Dry, Overflow, Protection Modes, or Mode Change	Ignored

11.3.2 IFAN operation

a. Min time interval between IFAN speed change in AUTOFAN Mode is 30 sec.

b. Min time interval between IFAN speed change in H/M/L Mode is 1 sec.

c. IFAN speed in Heat/Cool AUTOFAN Mode is determined according to the following chart:



Where in Heat Mode: ΔT = SPT - RT
in Cool Mode: ΔT = RT- SPT

11.3.3 OFAN Operation

Min time interval between OFAN ON/OFF state changes is 30 sec.

11.3.4 HE Operation

a. Min Heaters ON or OFF time is 30 sec.

b. Heaters can never be in operation while IFAN is OFF.

c. In RH group, HE-1 and HE-2 will be activated only when COMP is not operating, except in Dry Mode.

11.3.5 Protections

a. High pressure protection is applicable to all operating modes.

b. Deicing control is valid in Heat and Auto Heat Modes only.

c. Defrosting control is valid in Dry, Cool, and Auto Cool Modes.

11.3.6 Thermistors Operation

a. Return air Temp. is detected by RAT in normal Mode, or by RCT (R/C sensor) in I-FEEL Mode.

b. Indoor Coil Temp. is detected by ICT.

c. Outdoor Coil Temp. is detected by OCT.

d. Definition of thermistor faults:

1) Thermistor is disconnected - the thermistor reading is below – 30°C.

2) Thermistor is shorted - the thermistor reading is above 75°C.

3) Thermistor Temp reading doesn't change -

a) This test is performed only once after a unit is switched from OFF/STBY to operation. At the first occurrence of 10 min continuous COMP operation, the current ICT are compared with those when the COMP was switched from OFF to ON 10 min before. If the ΔT is less than 3°C, the thermistor is regarded as defective.

b) The ICT no-change error can be disabled together by connecting a 4.7kΩ resistor (5%) to the ICT connector. These resistors are equivalent to a thermistor 48+/-1^{O}C.

e. Cases for disabling ICT thermistor disconnected detection:

1) The detection of thermistor faults a. and b. above is disabled when Deicer Protection is started. The detection will be enabled again only after (1) the deicing is completed, and (2) COMP has been restarted and operated for 30 sec.

2) When all the following conditions are fulfilled:

a) 4.7kΩ resistor is connected to the OCT.

b) IFAN is OFF.

c) Compressor is ON.

d) ICT < -30 (disconnected).

11.3.7 RV Fault

This test is applied only in compressor units where 4.7kΩ resistor is not connected to the OCT.
The test is performed every time the unit is switched from OFF/STBY to OPER in Heat mode or changes operation mode from COOL/DRY to HEAT or (this applies also in AUTO COOL/HEAT mode).
If ICT is lower than 35°C at the time of mode change, then at the first occurrence of 15 min continuous COMP operation, ICT is compared with ICT reading when the COMP was switched from OFF to ON 15 min before. RV fault is defined when ICT decreases more than 5°C.
In this case, the COMP will stop and the SB LED will blink. The fault is reset after switching to SB or after mode change.

11.3.8 General Features

a. Allowed (control target) range for RAT is SPT +/-1ºC.

b. Whenever the unit is changed from COOL/DRY/STBY mode to HEAT mode or vice versa, the procedures below are followed:
Stop COMP for 3 min → Change RV state → Start COMP if necessary.

11.4 Cooling Mode

11.4.1 Cooling Mode – General

a. Mode Definition

Mode: COOL, AUTO (at Cooling)

Temp: Selected desired temperature.

Fan: HIGH, MED, LOW, AUTO.

Timer: Any

I-FEEL: ON or OFF

b. Room Temperature, RT, is detected by:

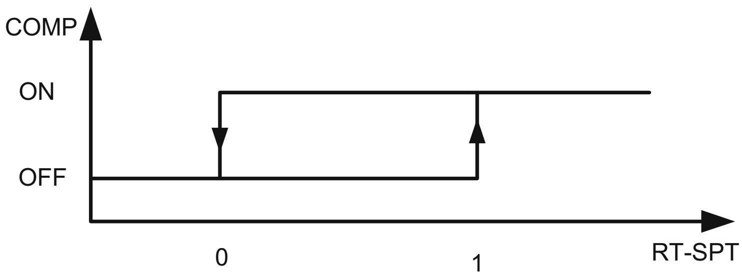
- RAT in normal operation, or
- RCT (R/C sensor) in I-FEEL mode.

c. Indoor Coil Temp is detected by ICT.

d. Outdoor Coil Temp is detected by OCT.

11.4.2 Control Functions

a. COMP Operation



b. OFAN Operation

- In normal operation OFAN operates together with the COMP.

c. IFAN Operation

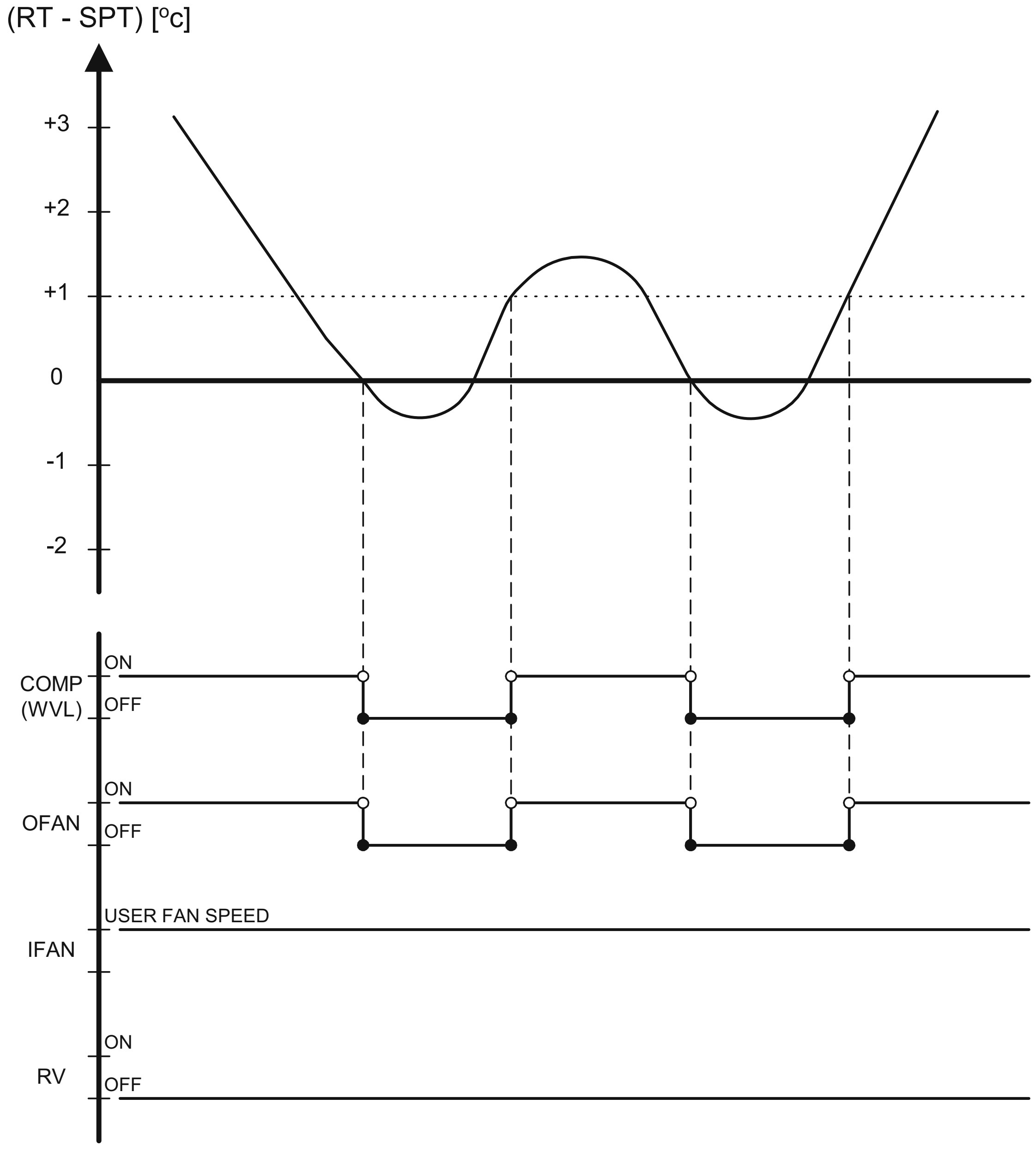
- IFAN will operate in ANY speed regardless the ICT or COMP state.
- IFAN speed will be determined according to user selection or AUTO-FAN logic

d. RV and HEATERS outputs

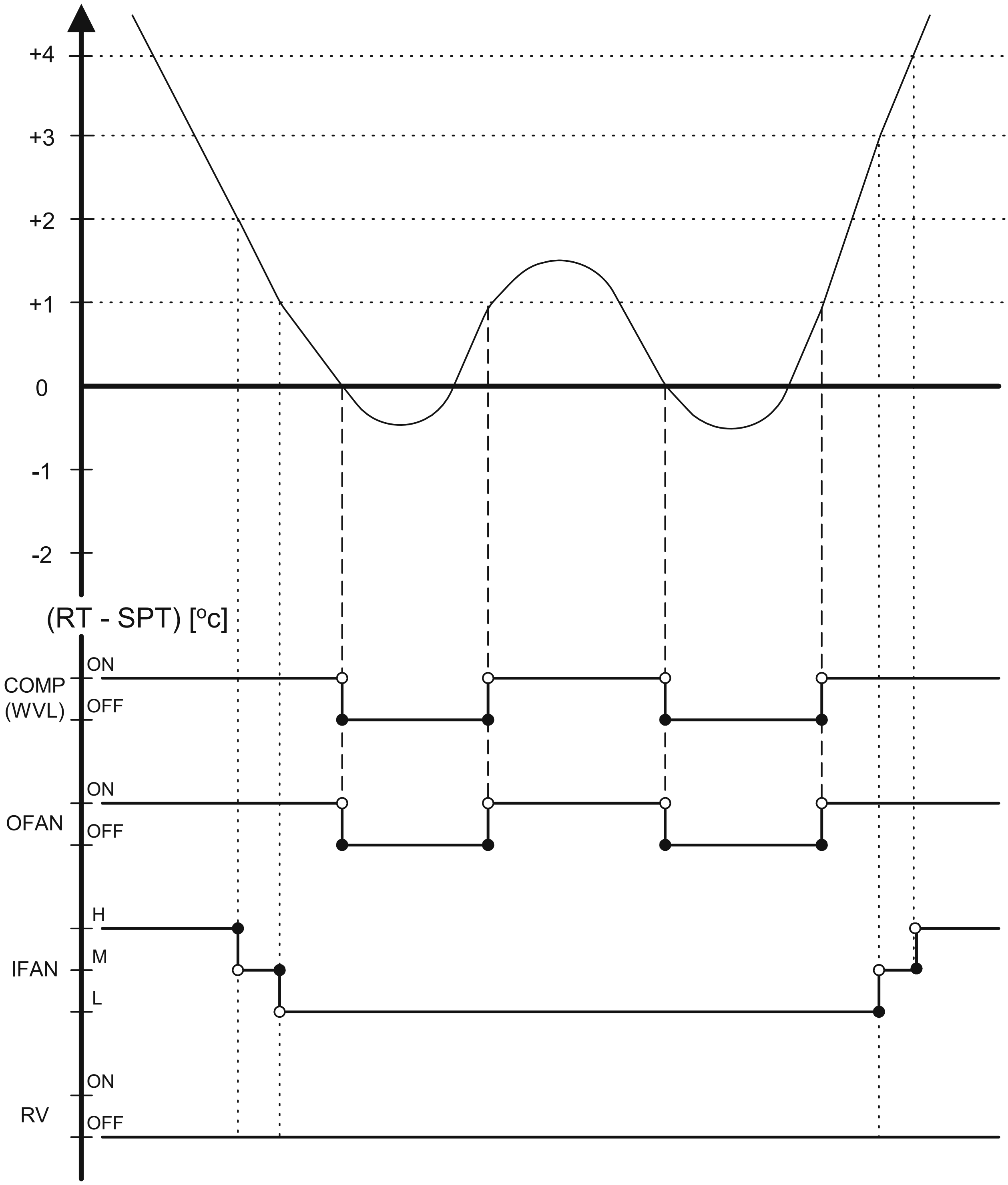
- RV and HEATERS are in OFF state in COOL mode.

11.4.3 Sequence Diagrams

a. Maintaining room temp at desired level by comparing RT and SPT with user defined IFAN speed.



b. Maintaining room temp at desired level by comparing RT and SPT with AUTO-IFAN.



11.5 Heating Mode

11.5.1 Heating Mode - General

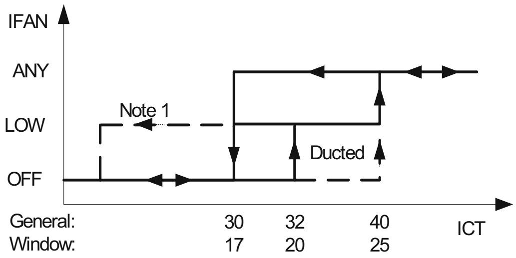
a. Compensation Procedure
When I-FEEL is OFF during HEAT mode: RT= RAT – CTV.
When I-FEEL is ON during HEAT mode: RT= RCT.

Type of Indoor	CTV
Wall Mounted	+3 °C
Mobiles / Floor Ceiling	+0 °C
Square /Window	+2 °C
Ducted	+4 °C
Cassettes	+4 °C

No compensation will be activated in Forced operation modes

b. IFAN operation rules for RC and SH groups:

1) As a general rule for **RC and SH groups,** IFAN will be switched ON according to the following graph:



NOTE 1

When COMP is ON (except WAX Model), IFAN will change from LOW to OFF either when:

a) ICT<28 and IFAN is on for 5 min or longer.

Or,

b) ICT<20

NOTE 2

When ICT is faulty:
When the compressor switches from OFF to ON (excluding deicing), IFAN will be on in ANY speed.
When the compressor switches from ON to OFF, the IFAN will change to LOW speed for 30 seconds and then it will be off.

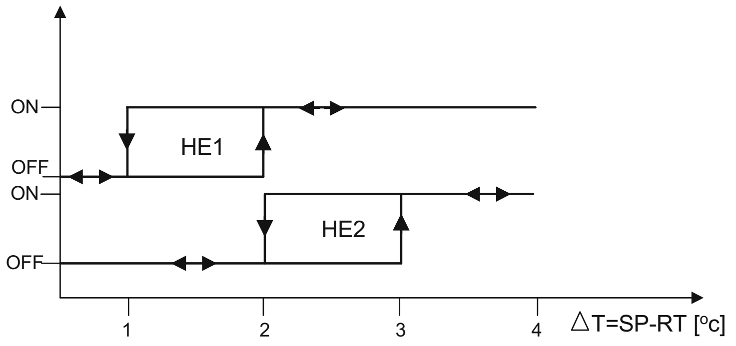
2) In SH or RC group, IFAN will operate for Min 30 sec according to 1) above after HEs are turned off, where in a case it has to be OFF, it will be forced to LOW speed.

c. IFAN operation rules for RH group

1) In RH group, IFAN starts when HE starts. When HE switches to OFF, IFAN switches to LOW for 30 sec and then stops.

d. Heaters operation rules for RC and SH groups:

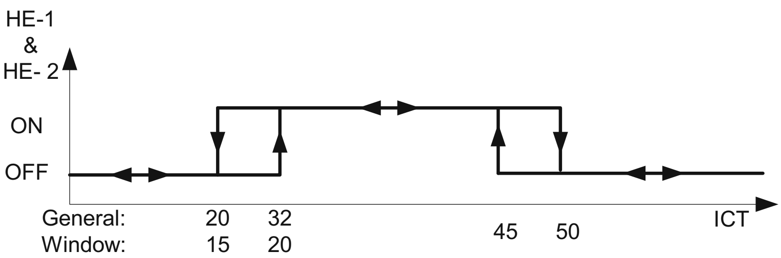
1) For both RC and SH groups, Heaters versus ΔT is as follows:



2) Operation rules for Heaters in RC group:

a) Heaters can be enabled only if IFAN is ON.

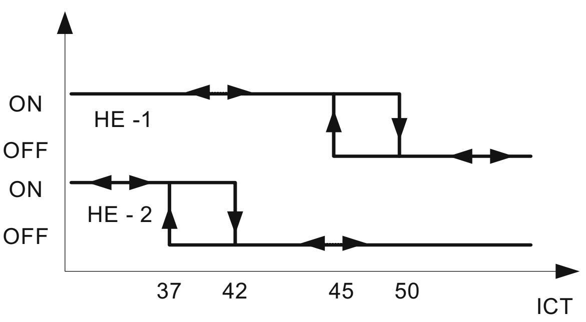
b) Heaters will operate according to ΔT **and** the following graph:



3) Rules for Heaters operation in SH group:

a) When heaters are to be ON and IFAN is to be OFF according to d. 1) above, IFAN will be forced to LOW speed.

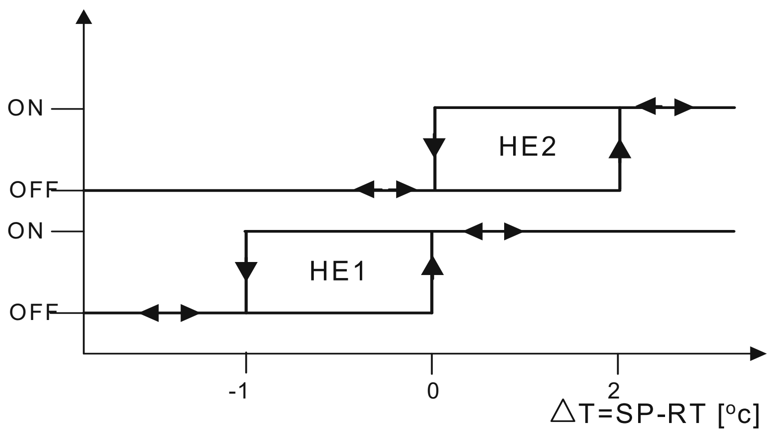
b) Heaters will operate according to ΔT and the following graph:



4) For both RC and SH groups, excluding deicing, HE1 and HE2 can be ON only when the compressor is ON.

e. Heaters operation rules for RH groups:

1) In RH group, HE operation is according to the difference between RAT and SPT.



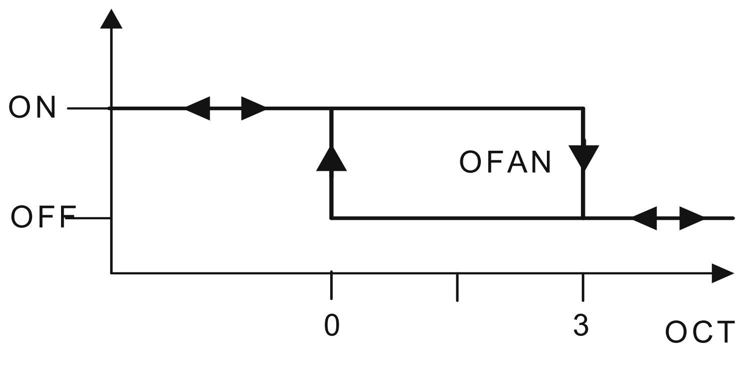
f. OFAN Operation for RC and SH groups

1) As a general rule for RC and SH groups, excluding protection modes, OFAN starts with the compressor.

2) When OFAN is ON it will operate according to the following conditions:

a) OFAN operates together with the compressor.

b) When $(RT \geq SPT - 2)\ and\ ICT \geq 50$ and the 4.7kΩ resistor is not connected to the OCT, OFAN will operate according to the following curve:



11.6 Heating, RC or SH Group

Mode: HEAT, AUTO (at heating)

Temp: Selected desired temperature

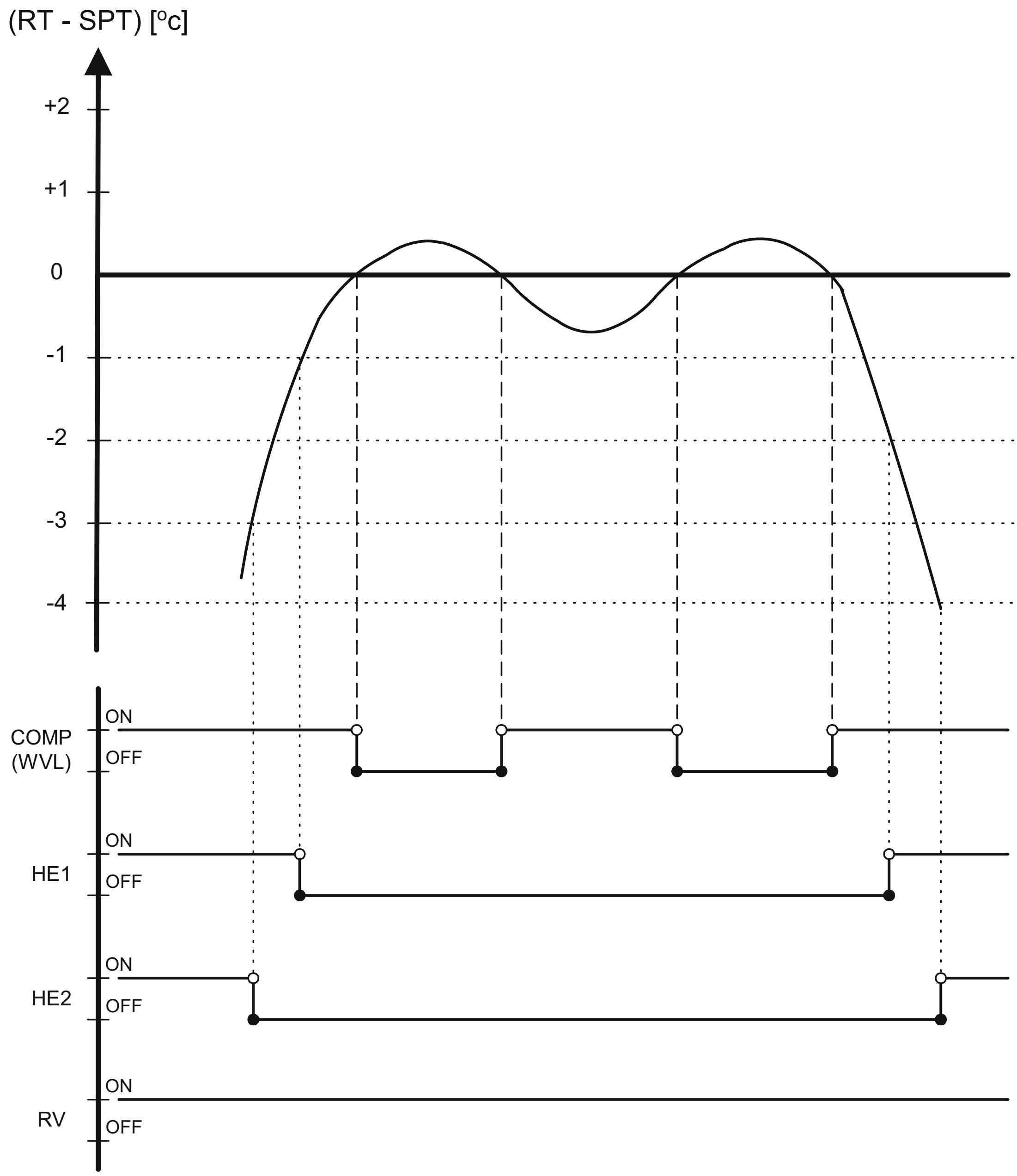
Fan: HIGH, MED, LOW

Timer: Any

I-FEEL: ON or OFF

11.6.1 Sequence Diagram

Maintains room temp. at desired level by comparing RAT or RCT to SPT.



11.7 Heating, RC or SH Group with Autofan

Mode: HEAT, AUTO (at heating)

Temp: Selected desired temperature

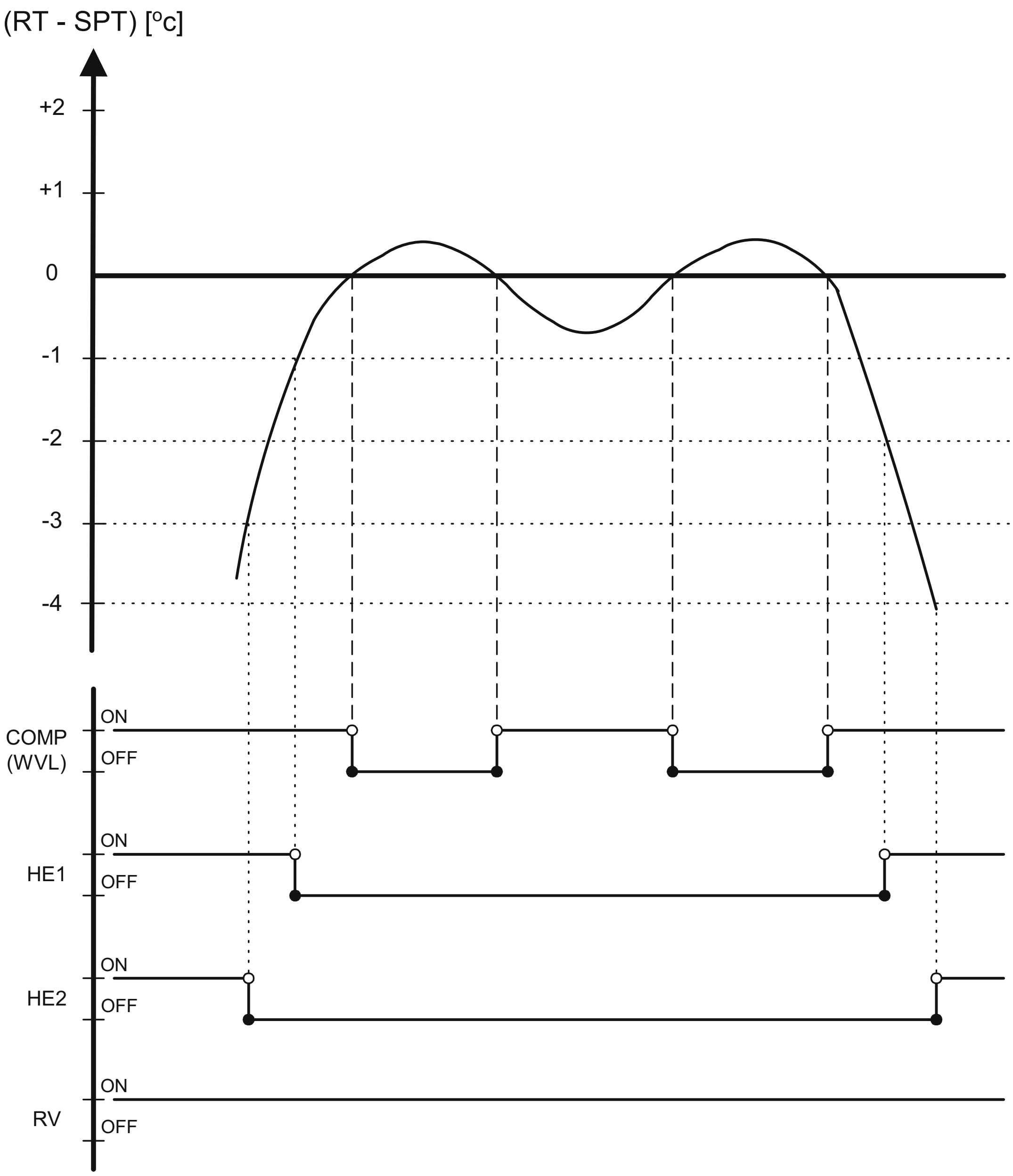
Fan: AUTO

Timer: Any

I-FEEL: ON or OFF

11.7.1 Sequence Diagram

Maintains room temp at desired level by controlling COMP, IFAN and OFAN.



CONTENTS

11.8 Heating, RH Group

Mode: HEAT, AUTO (at Heating)

Temp: Selected desired temperature

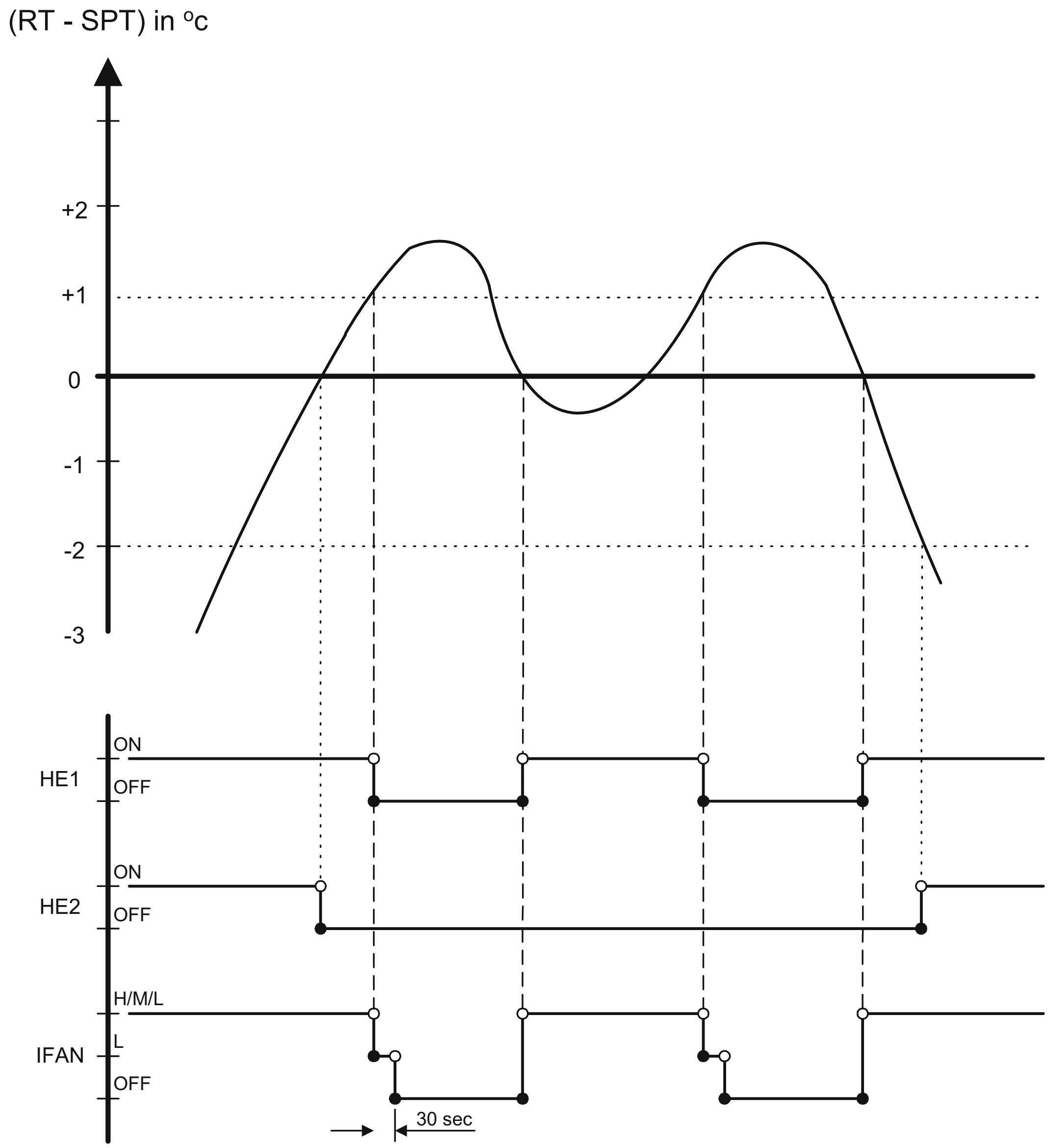
Fan: HIGH, MED, LOW

Timer: Any

I-FEEL: ON or OFF

11.8.1 Sequence Diagram

Maintains room temp at desired level by controlling Heating Elements: HE1 or HE2.



11.9 Heating, RH Group, with AUTOFAN

Mode: HEAT, AUTO (at Heating)

Temp: Selected desired temperature

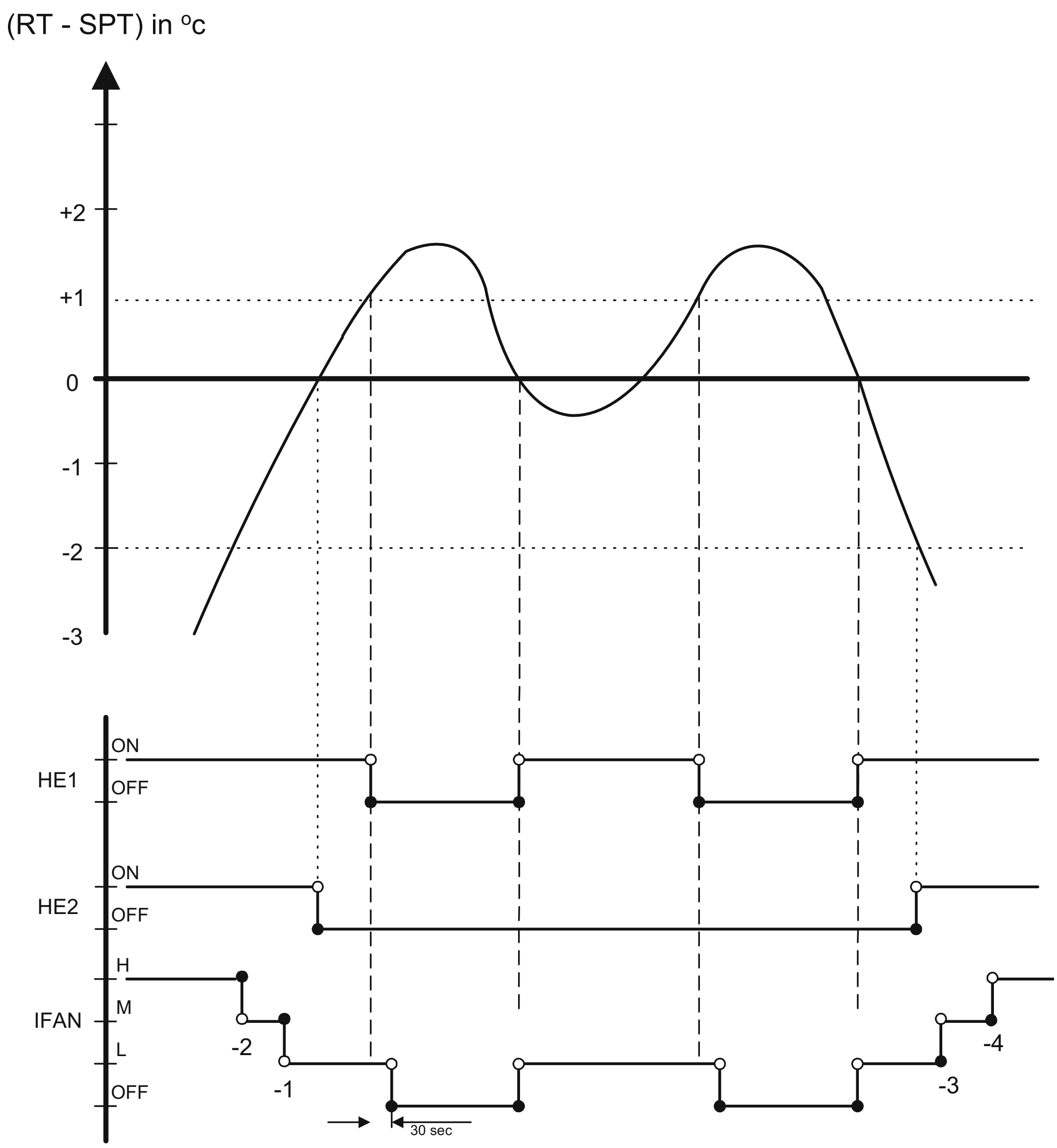
Fan: AUTO

Timer: Any

I-FEEL: ON or OFF

11.9.1 Sequence Diagram

Maintains room temp. at desired level by controlling the 2-Stage Electric Heaters.



CONTENTS

11.10 Automatic Cooling or Heating

11.10.1 Automatic Cooling or Heating - General

The AUTO Mode is for models with compressor and the WVL-RH only. The WVL-ST, RC and SH units do not work in AUTO Mode.

a. Mode Definition

Mode: AUTO

Temp: Selected desired temperature

Fan: Any

Timer: Any

I-FEEL: ON or OFF

b. Switching-temperature between Cooling and Heating is SPT $\pm$ 3°C.

c. When the AUTO Mode is started with SPT +/-0 ^{O}C, the unit will not select Auto Heat or Auto Cool mode immediately. Instead, the unit will be in a temporary FAN Mode with IFAN operating at low speed. The proper Auto Heat mode or Auto Cool will be started whenever the RT reaches SPT-1^{O}C or SPT+1^{O}C respectively.

d. For RC & SH units, Mode change between Auto Heat & Auto Cool Modes is possible only after the COMP has been OFF during the last T minutes.

Mode Change	Time, T
Auto Cool to Auto Heat	3 min
Auto Heat to Auto Cool	4 min

e. For RH and WVL-RH units, Mode change between Auto Heat & Auto Cool Modes is possible after the COMP/HEs have been OFF during the last T minutes.

Mode Change	Time, T
Auto Cool to Auto Heat	COMP off for 3 min
Auto Heat to Auto Cool	HEs off for 3 min

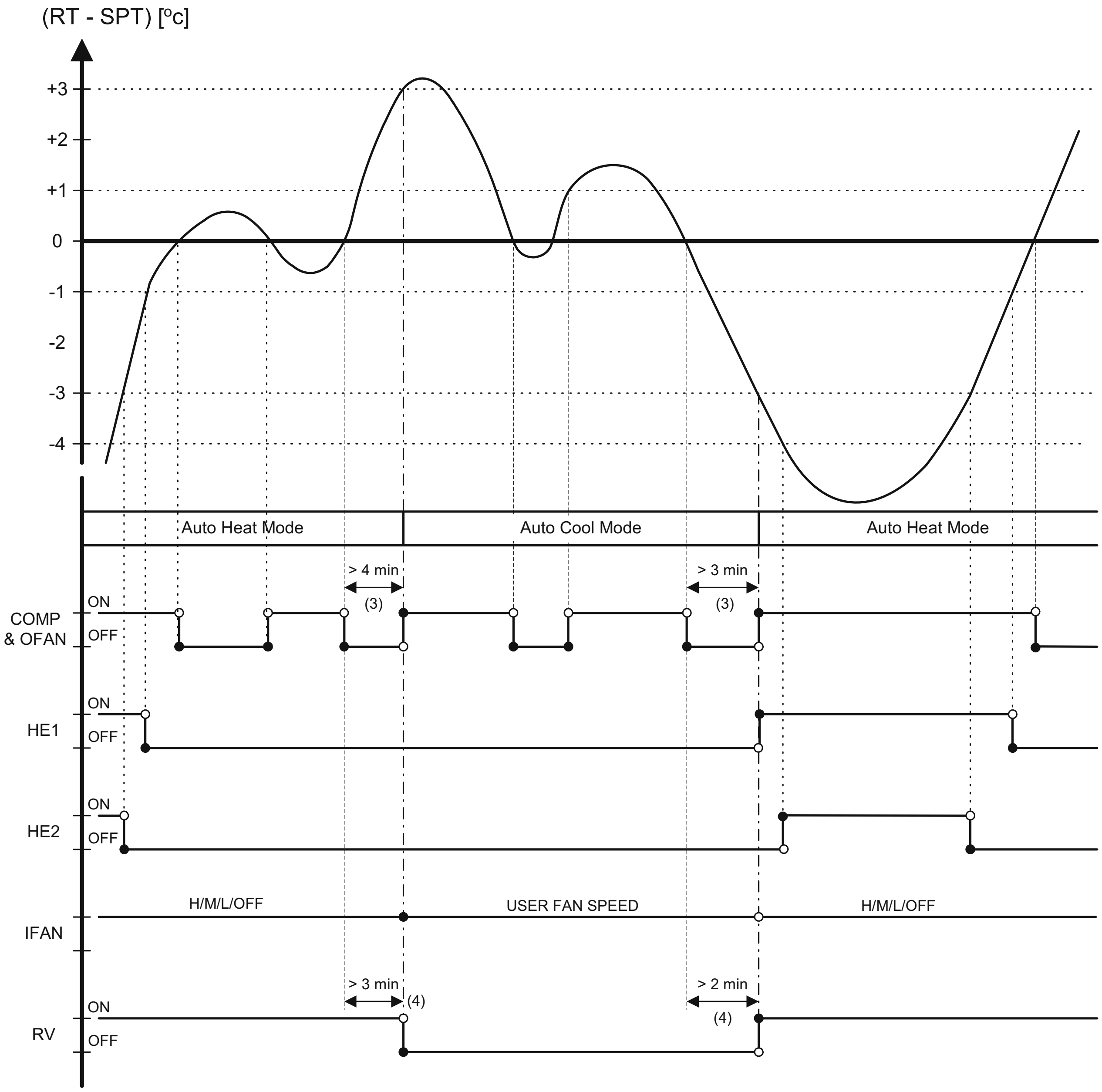
f. When unit is changed form Cool/Dry Mode to Auto Mode, the unit will continue to operate in (Auto) Cool Mode until the conditions for switching from Auto Cool to Auto Heat are satisfied.

Similarly, when unit is changed from Heat Mode to Auto Mode, the unit will continue to operate in (Auto) Heat Mode until the conditions for switching from Auto Heat to Auto Cool are satisfied.

11.10.2 Sequence Diagrams

a. Auto Cooling or Heating, RC or SH Groups

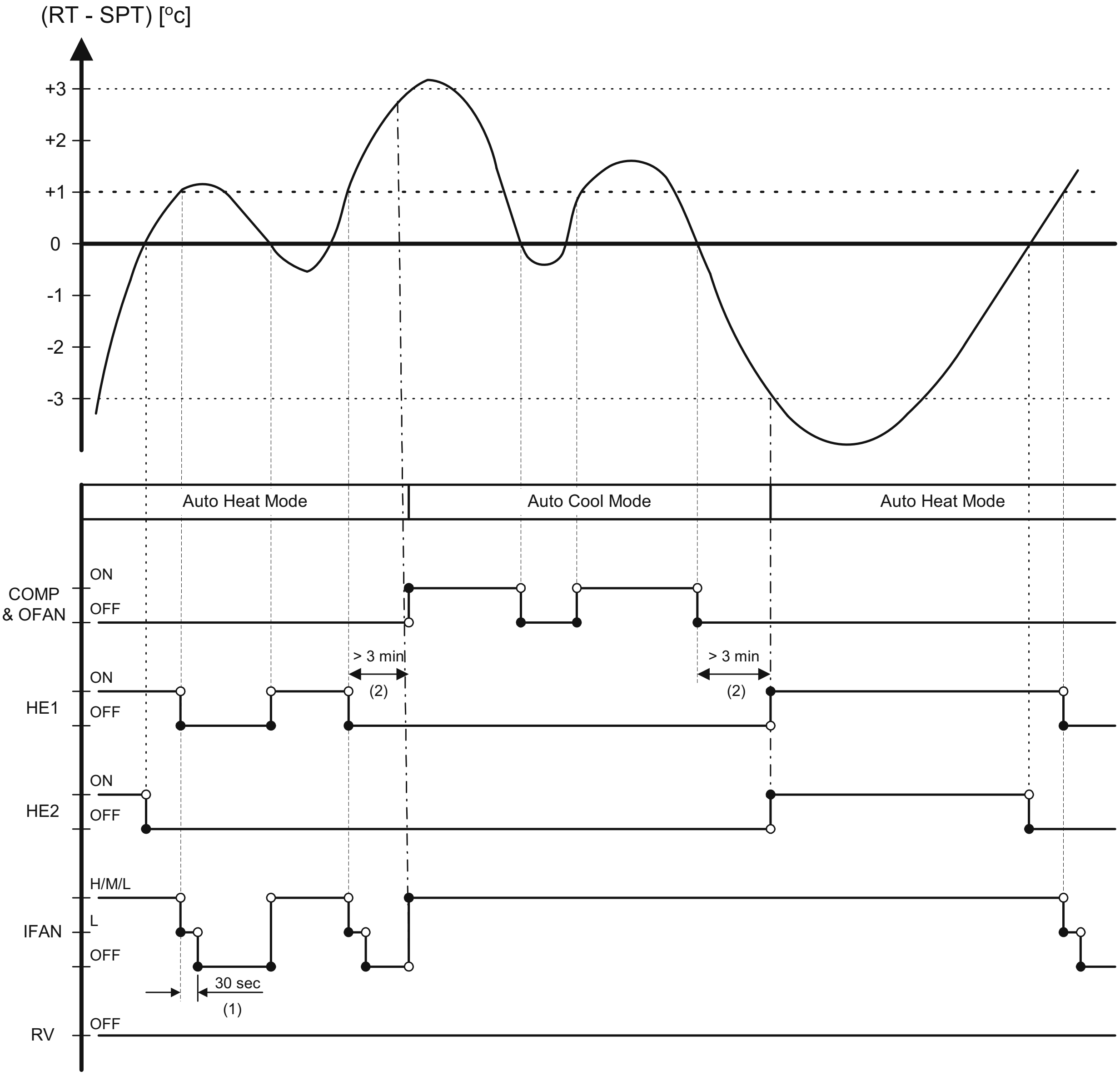
Maintains room temp. at desired level by selecting between cooling and heating modes.



CONTENTS

b. Auto Cooling or Heating RH Group

Maintains room temp. at desired level by selecting between Cooling or Heating Modes.

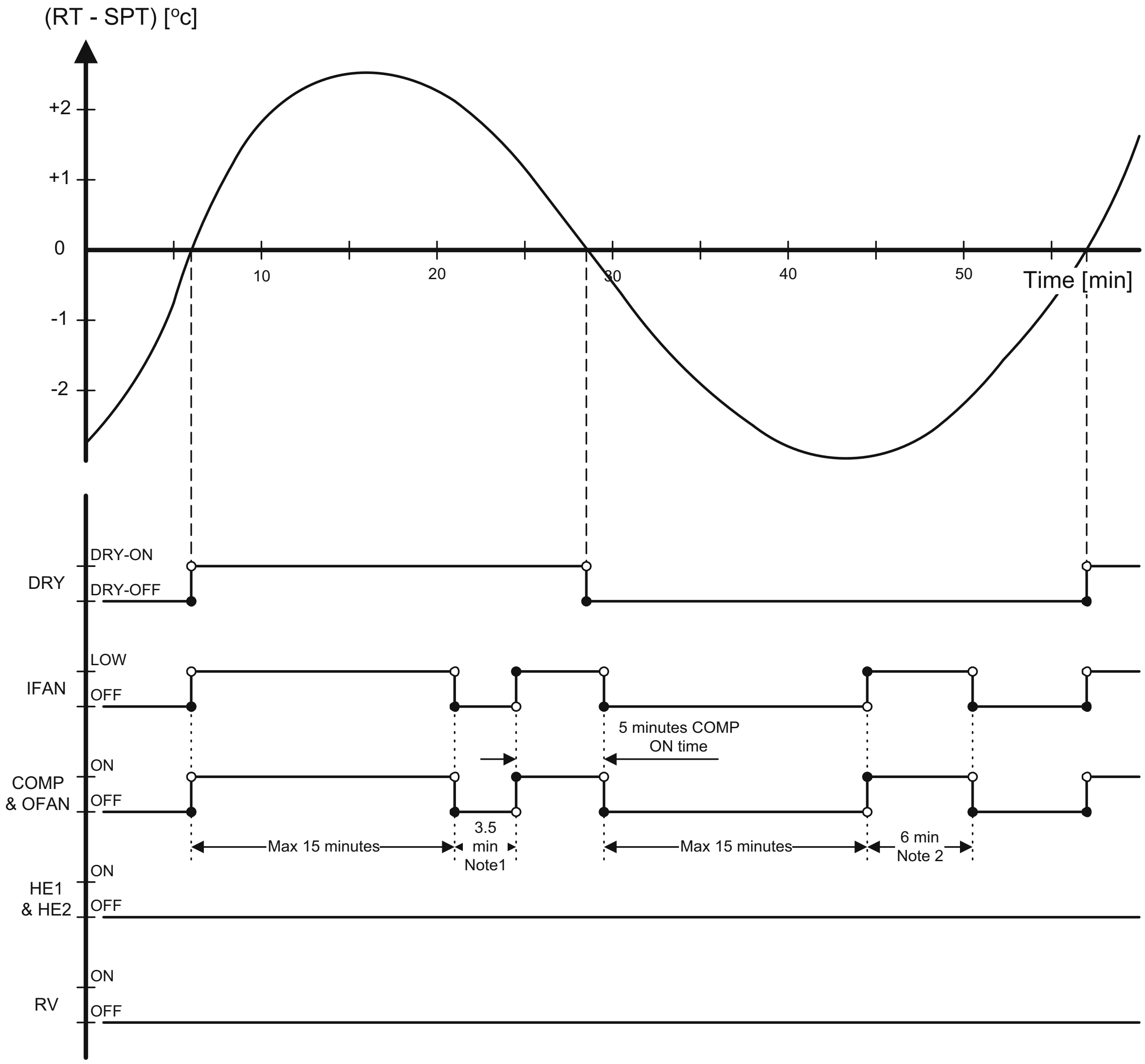


11.11 Dry Mode

11.11.1 Dry, ST or RC Group or P2000 Model with Any Group Settings

Mode: DRY
Temp: Selected desired temperature
Fan: LOW (automatically selected by software)
Timer: Any
I-FEEL: Any

Control function
Reduce room humidity with minimum temp. fluctuations by operating in Cool Mode with LOW speed IFAN.



NOTES

1. When DRY is ON, the COMP is forced OFF for 3.5 min (longer than the 3 min Min COMP- OFF time) after every 15 min of continuous COMP operation.
2. When DRY is OFF, the COMP is forced ON for 6 min (longer than the 3 min Min COMP- ON time) after every 15 min of continuous COMP OFF time.
3. When DRY is changed from ON to OFF or vice versa, the limits mentioned in (1) & (2) are ignored. The COMP operation is only controlled by the 3 min Min OFF time and 1 min Min ON time.
4. In DRY Mode, IFAN is LOW when COMP is ON, and is OFF when COMP is OFF.
5. HEs are always OFF in DRY Mode.

11.11.2 DRY, SH or RH group

Mode: DRY

Temp: Selected desired temperature

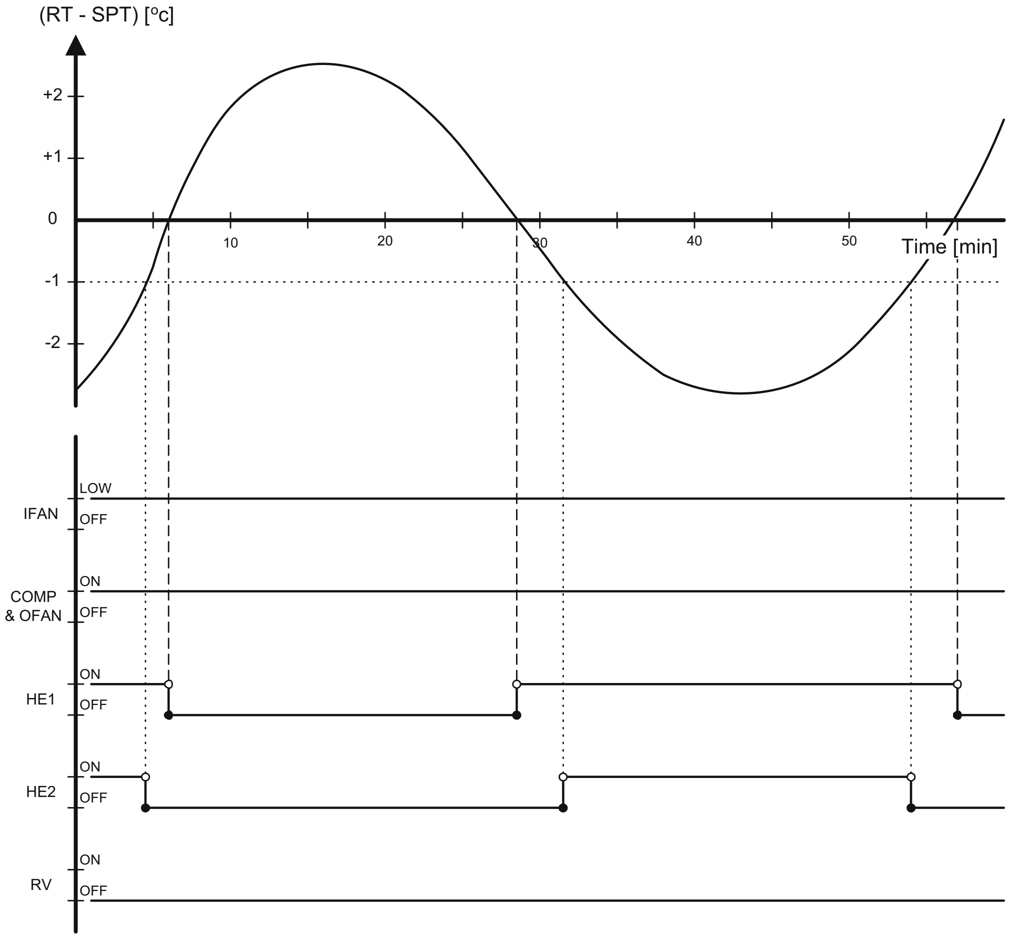
Fan: LOW (automatically selected by software)

Timer: Any

I-FEEL: Any

Control function

Reduces room humidity with minimum temp. fluctuations by operating in Cool Mode with LOW speed IFAN and HE.



11.12 Protection

11.12.1 Cooling Mode Protections

a. Indoor Coil Defrost

Mode: COOLING, DRY, AUTO

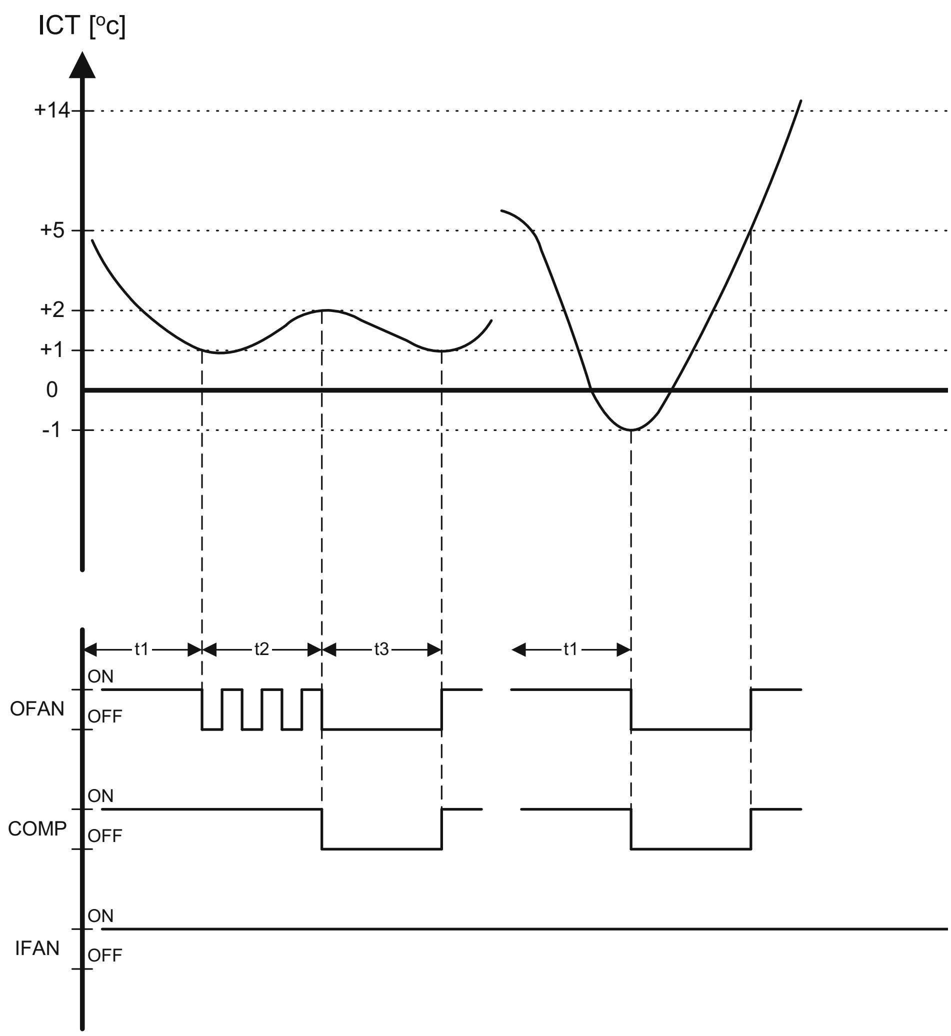
Temp: Selected desired temp.

Fan: Any

Timer: Any

I-FEEL: ON or OFF

Control Function
Protects the indoor coil from ice formation at low ambient temperatures.



t1 = 5 min minimum for each COMP starting.
t2 = OFAN cycling (alternate between ON and OFF every 30 sec) for 20 min maximum.
t3 = COMP and OFAN stops for 10 min minimum.

b. High Pressure Protection

Mode: (AUTO) COOLING or DRY

Temp: Selected desired temperature

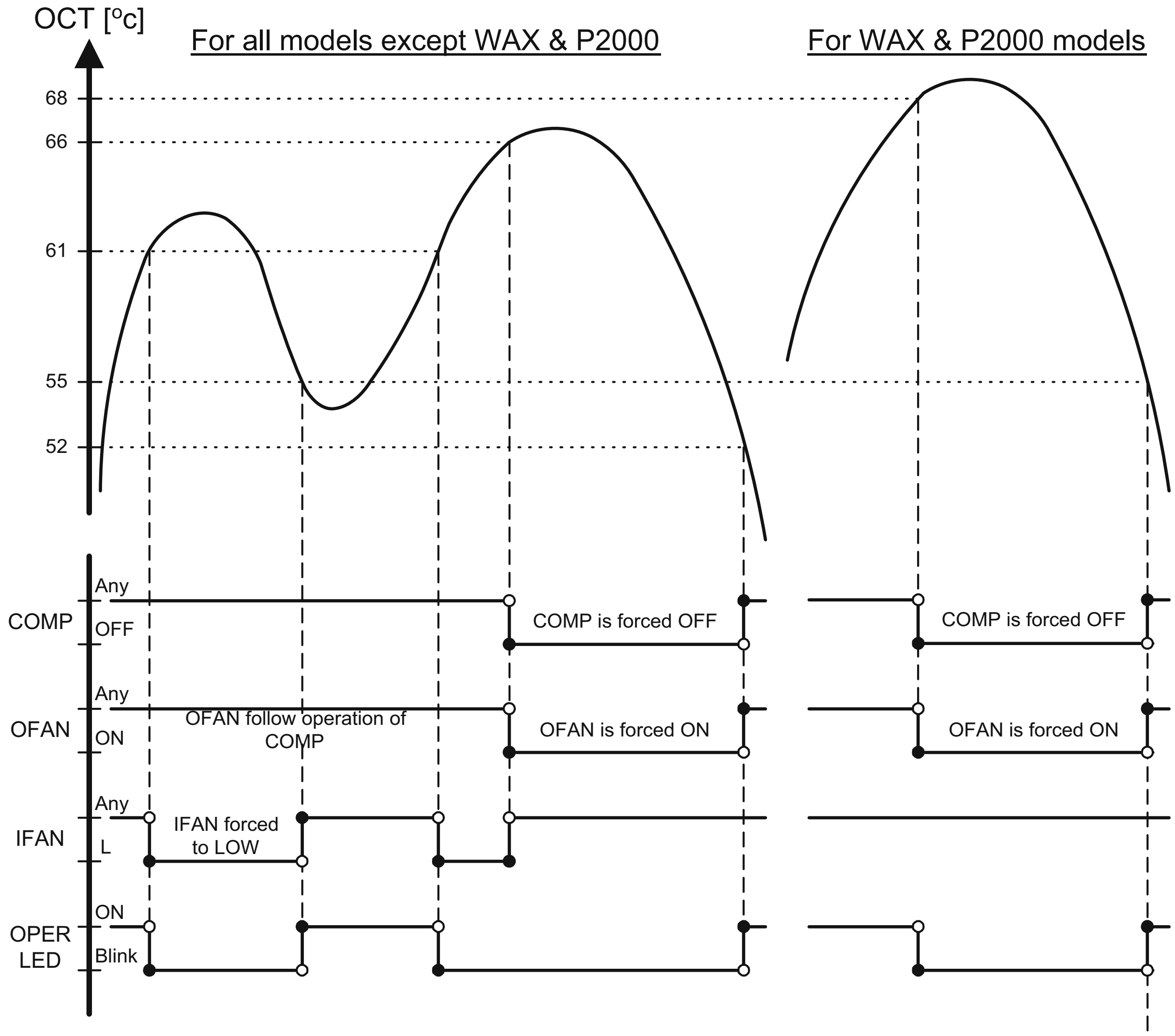
Fan: Any

Timer: Any

I-FEEL: ON or OFF

Control Function

To protect the COMP from the high pressure build-up in the outdoor coil during normal cooling operation, by switching OFF the IFAN and COMP.



NOTE

The ICT is also monitored during COOL and DRY modes, in case the RV control circuit is faulty. Whenever ICT reaches 70°C, which indicates a high pressure in the indoor coil, the COMP will be forced OFF automatically. The COMP can be turned ON again only after the ICT is under 70°C again and after the 3 min COMP ON delay time. The OPER LED will not blink in this case.

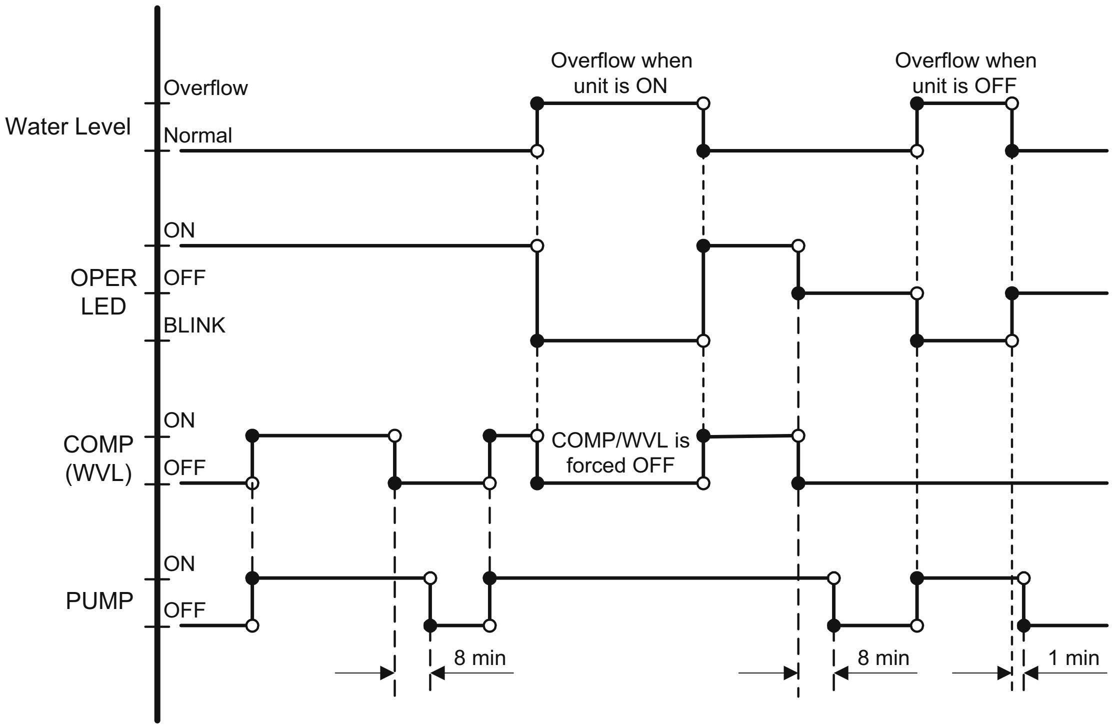
11.12.2 Condensation Pump.

Mode: Cool, Dry, Auto

Temp: Selected desired temperature
Fan: Any
Timer: Any
I FEEL: Any

<u>Control function:</u>

Prevent Condensed water from Overflowing.



Notes:

1. The switch used for water level detection is closed under normal condition, and is open when water overflow.
2. For the NEC version of MCU, the "Over Flow" & “Normal” condition are indicated by logic “0” & “1” at the LEVEL4 input pin respectively.
3. For the Fujitsu version of MCU, the "Over Flow" & “Normal” condition are indicated by logic “1” & “0” at the LEVEL4 input pin respectively.
4. The “Overflow” condition can activate the water pump in SB and operating modes.

11.12.3 Heating Mode Protections

a. Outdoor Coil Deicing (excluding RH Group)

Mode: HEATING, AUTO (at heating)

Temp: Selected desired temperature

Fan: Any

Timer: Any

I-FEEL: Any

Control function

To protect the outdoor coil from ice formation by controlling COMP & RV operation.

1) Deicer Activation Algorithm

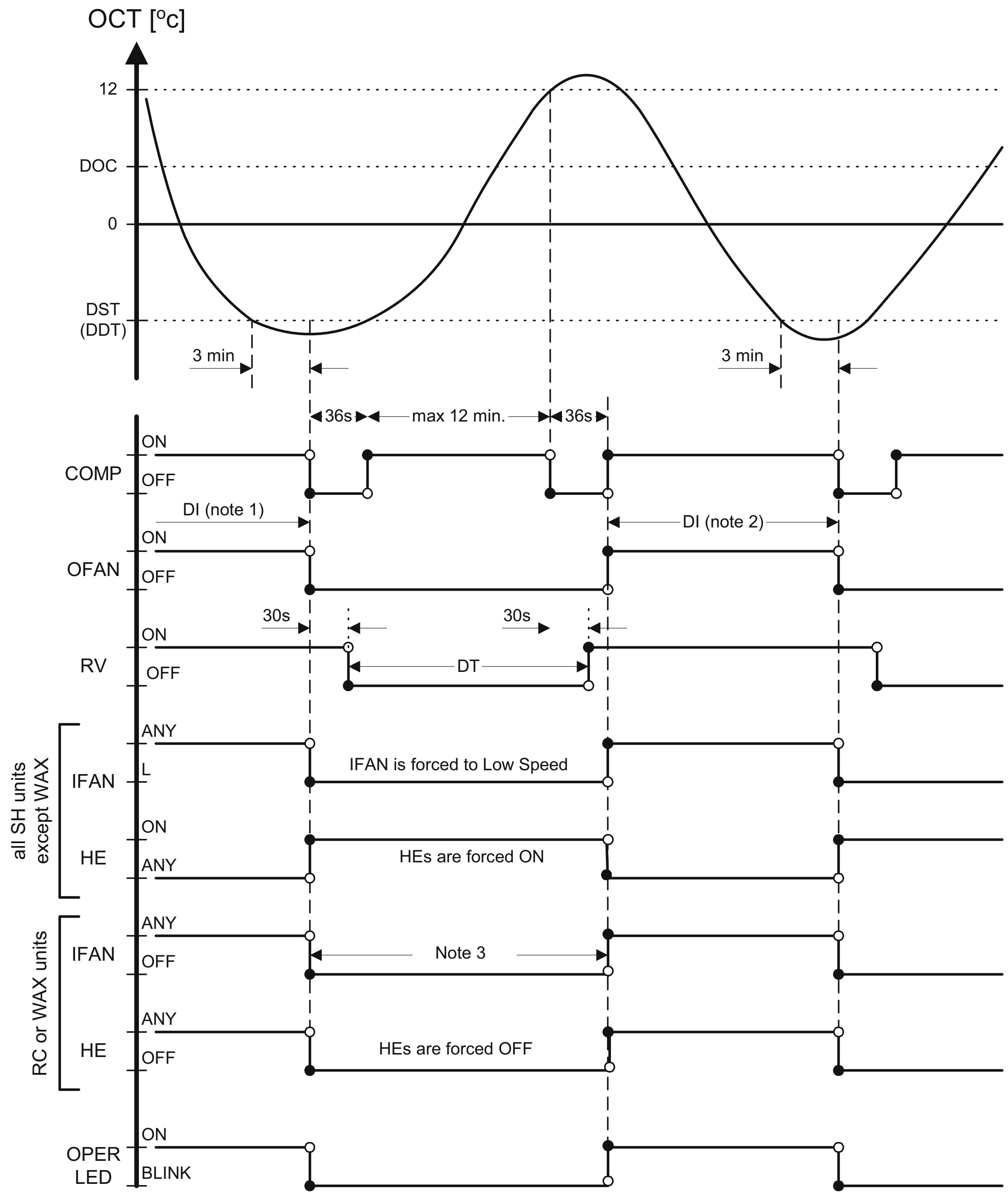
a) Static deicer threshold is -5°C

b) Dynamic deicer threshold changes of 3°C in 3 minutes in the OCT temperature

c) In first COMP activation (after SB or OFF), if OCT < 0°C, min time to first deicer is 10 min else 40 min.

d) In a case of reading 3 successive OCT values below –10°C and previously 3 successive OCT values of 43°C (4.7 K) , the unit will activate deicing procedure.

2) Deicing procedure



NOTES

1. **In the following Deicing cycles, the time interval between two Deicing cycles activation is between 30 to 80 min.**
2. **For RC group, IFAN is forced OFF.**
3. **For SH group, HEs are forced ON and IFAN is forced to operate at LOW speed, regardless of the ICT and difference between RAT & SPT.**
4. **When jumper J7 is set, the DST value is -2°C.**

b. High Pressure Protection (excluding RH Group)

Mode: (AUTO) HEATING

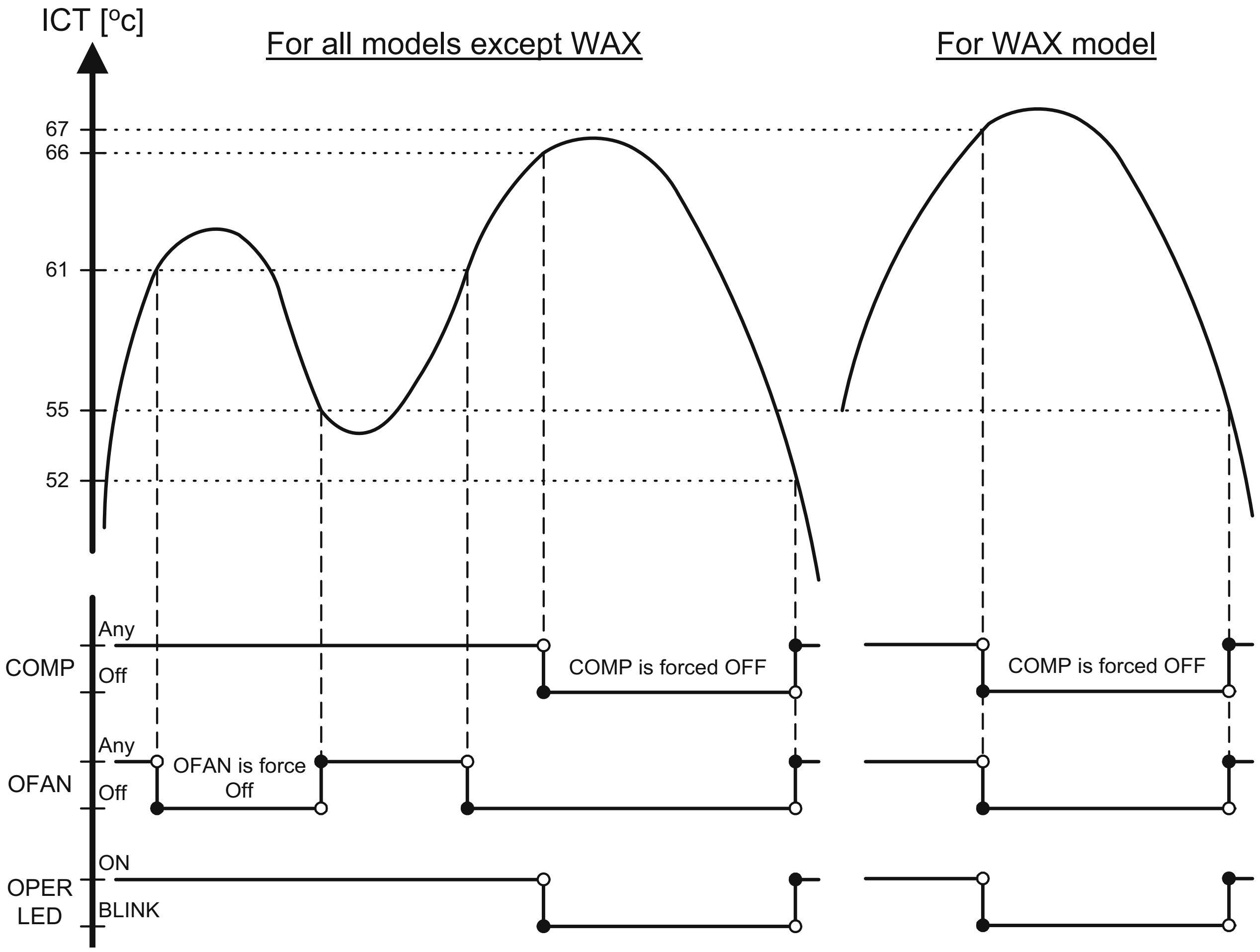
Fan: Any

Timer: Any

I-FEEL: ON or OFF

Control Function

Protects the compressor from high pressure by switching OFF the OFAN and COMP.



11.13 Forced Operation (Excluding PRX & PXD Models)

a. Forced operation allows units to start, stop and operate in cooling or heating in preset temp. according to the following table:

Forced Operation Mode	Pre-set Temp for : MBX, P2000, PX Models	Pre-set Temp for : FCD, RWK ,ELD, ECC, WAX, WNX, WMN Models
Cooling	20 ºC	22 ºC
Heating	25 ºC	28 ºC

NOTES

1. **While under the forced operation, the temperature compensation schedule is disabled.**
2. **The forced operation is activated when the mode button on the Display Board is used to switch the unit to COOL or HEAT mode.**
3. **The IFAN is always set to Autofan Speed in forced operation.**

Temp: Set – desired temperature selected

Fan: Any

Timer: Interact with Sleep Timer

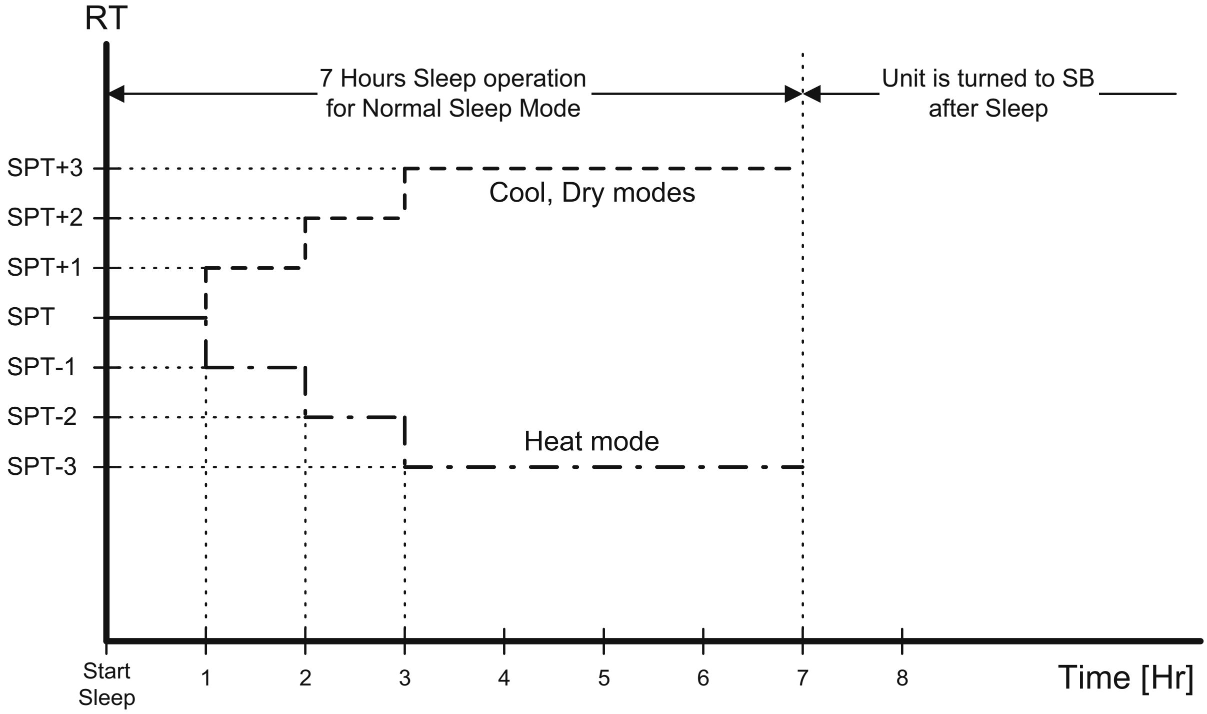
I-FEEL: ON or OFF

The Sleep mode is activated by using the SLEEP button on the R/C. In Sleep Mode, the unit will automatically adjust the SPT to turn up/down the room temperature (RT) gradually to provide maximum comfort for the sleeping user.

Sleep is treated as TIMER function. Therefore, the TIMER LED is activated similar to TIMER function.

11.14 SPT Adjustment in Sleep Mode

- In COOL, AUTO COOL or DRY modes, the SPT adjustment is positive (from 0 to +3°C).
- In HEAT or AUTO HEAT modes, the SPT adjustment is negative (from 0 to -3°C).
- In other modes, there is no SPT adjustment.
- The SPT adjustment is cancelled when the Sleep mode is cancelled.



NOTE

If OFF-timer is active, the unit may go to SB before or after 7 hours of sleep operation.

11.14.1 Time Adjustment in SLEEP Mode

In 10V4, the user can make use of the Off-Timer to extend the Sleep Time from 7 hours to 12 hour (max). The operation of the new "Extended Sleep Mode" is illustrated by the graphs below.

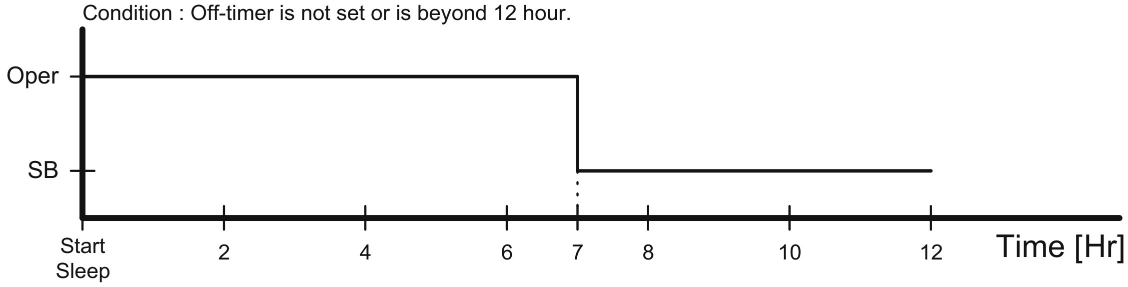
Case 1 is the Standard Sleep Mode, which is the only sleep mode in the previous version of MCU. The A/C unit simply works for 7 hours, then goes to SB.

Case 2 is the new Extended Sleep Mode. If an active Off-Timer is set to turn off the A/C between 7-12 hour, relative to the starting of Sleep, the Sleep time is extended. And, instead of going to SB at the 7th hour, the A/C will work until reaching the Off-time.

Case 3 is an exception to case 2. The Sleep Mode will not be extended to the Off-Time when the Off-Timer is preceded by an On-Timer, which is also between 7-12 hour.

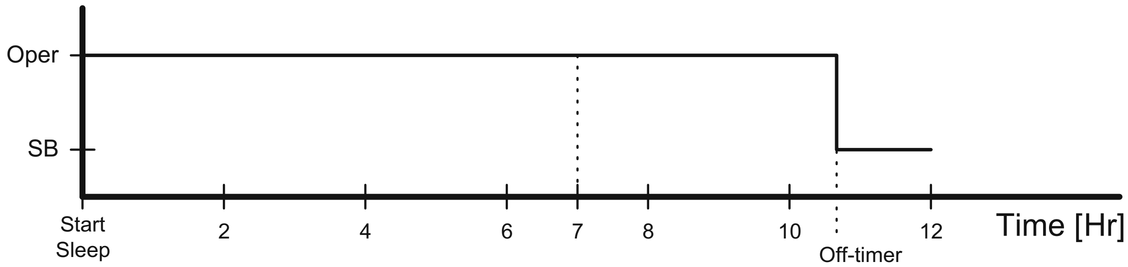
Case 1 : Standard Sleep Mode

Condition : Off-timer is not set or is beyond 12 hour.



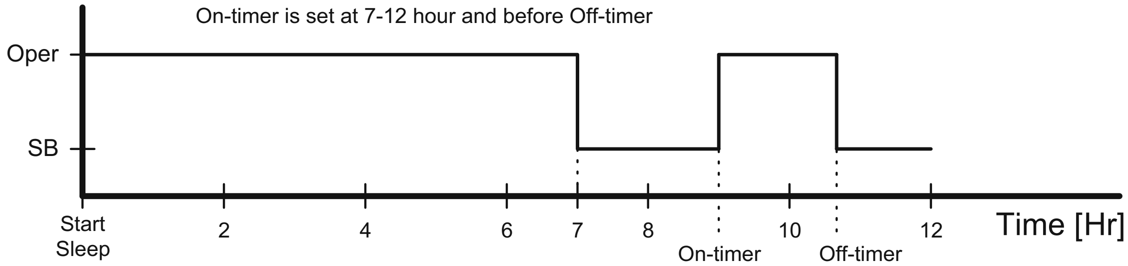
Case 2 : Extended Sleep Mode

Condition : Off-timer is set at 7-12 hour.



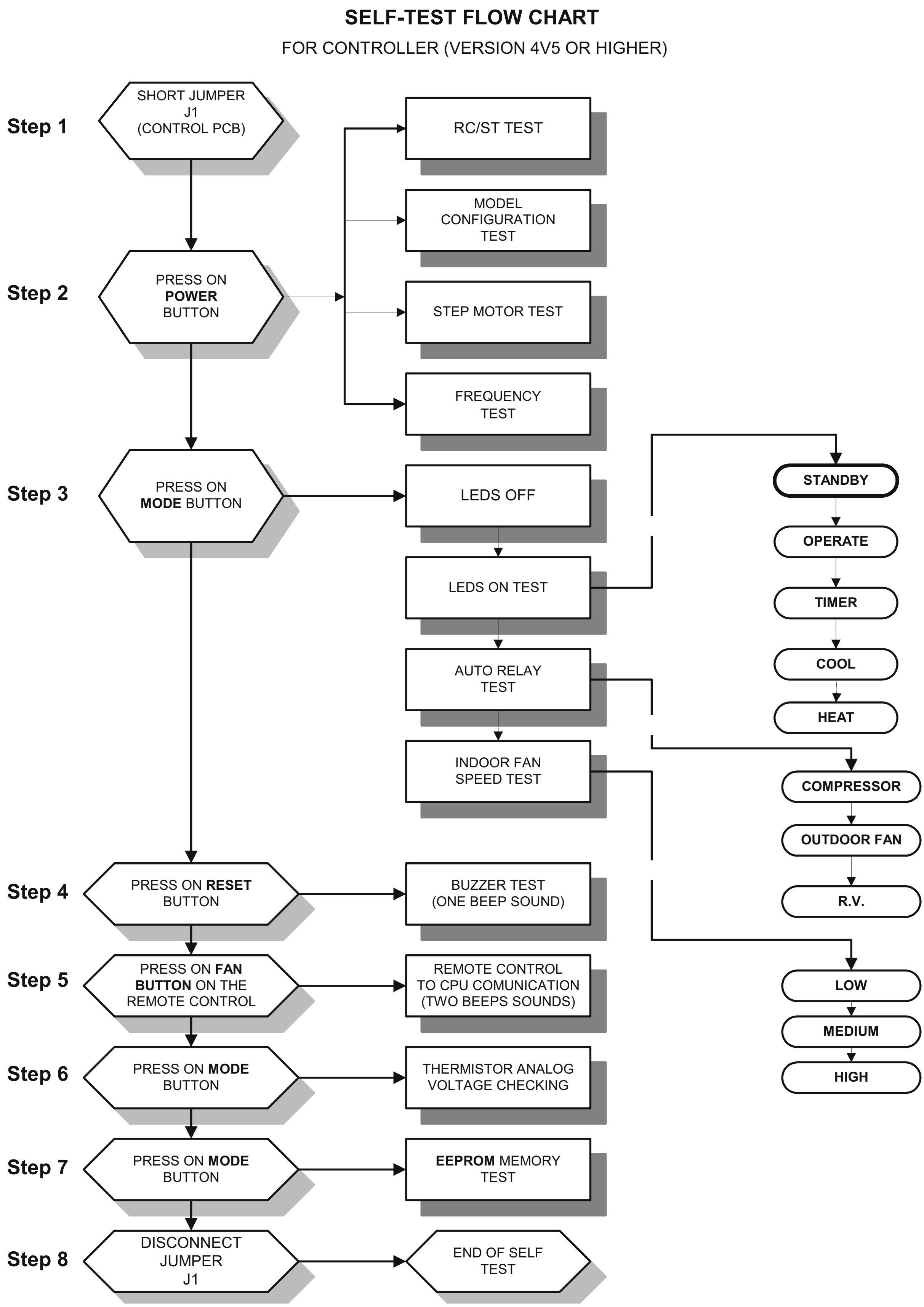
Case 3 : Exception to Case 2

Condition : Off-timer is set at 7-12 hour
On-timer is set at 7-12 hour and before Off-timer



11.15 Controller Self-Test Procedure

11.15.1 By Shorting Test Jumper J1



11.15.2 By Remote Control Settings:

a. STEP 1: TURNING ON THE POWER.
Turn ON the power, make sure that the unit is in operation.

b. STEP 2 : ENABLE SELF-TEST MODE

1) Use the remote control to send the first settings to display / indoor unit HEAT mode, HIGH IFAN, set temperature to 16 ºC, no I-FEEL Sleep or any other timer settings are needed.
2) Cover the IR transmitter components in the remote control so that it will not transmit the signals to the indoor unit display.
3) Use the remote control to send the second settings to display / indoor unit COOL mode, LOW IFAN, no I-FEEL Sleep or any other timer settings.
4) Uncover the remote control IR transmitter and change the temperature settings. If the display/indoor unit receive the settings properly the following steps will start:

c. STEP 3: MODEL SETTING CONFIRMATION

1) The STAND-BY and COOL LEDS will indicate the operation mode as follows:

OPERATION MODE	STAND-BY LED	COOL LED
ST	ON	OFF
RC	OFF	OFF
SH	OFF	ON
RH	ON	ON

2) Testing the Model configuration. Selected by the COMP, STAND-BY, TIMER LEDS and FILTER will indicate the model configuration as follows (the relevant line for this manual is highlighted):

MODEL	COMP	OPERATE LED	TIMER LED	FILTER LED
WNG	ON	OFF	OFF	OFF
MBX	ON	OFF	OFF	ON
WNX	ON	OFF	ON	OFF
PRX	ON	ON	OFF	OFF
WMN1	ON	ON	OFF	ON
EMD/LS	ON	ON	ON	OFF
ECC-K	ON	ON	ON	ON
WMN 4	OFF	OFF	ON	OFF
PXD	OFF	OFF	ON	ON
WMN 2/WHX	OFF	ON	OFF	ON
WMN 3	OFF	ON	ON	ON

In this term the step motor will turn to HOME POSITION.

d. STEP 3: AUTO LED WALK TEST.

1) All the LEDS will turn OFF.

2) All the LEDS will turn ON for 1 second one by one in the following sequence:

STAND-BY ⇨ OPERATE ⇨ TIMER ⇨ FILTER ⇨ COOL ⇨ HEAT.

3) In PRX all the LEDS will turn ON for 1 second one by one in the following sequence : 18 °c ⇨ 20 °c ⇨ 22 °c ⇨ 24 °c ⇨ 26 °c ⇨ 28 °c ⇨ 30 °c ⇨ High IFAN ⇨ Auto IFAN ⇨ Med IFAN ⇨ Low IFAN ⇨ STAND-BY⇨ TIMER ⇨ FILTER ⇨COOL⇨ HEAT.

e. STEP 4: AUTO REALY WALK TEST:

All relays will energize one by one in the following sequence:

COMPRESSOR ⇨ OUTDOOR FAN⇨R. V. ⇨ HEATER 1 ⇨ HEATER 2 ⇨ INDOOR WATER PUMP ⇨ SWING or OUTDOOR WATER PUMP ⇨ INDOOR FAN: LOW ⇨ MID ⇨ HIGH.

When the relay walk test is completed, the next test will start automatically.

f. STEP 5: FREQUENCY TESTING:

If the frequency measuring process fails the COOL LED will turn ON. In order to move to the next step, press ON/OFF button on the remote control.

g. STEP 6: INPUT TEST.

The test purpose is to check the analog real time indicators (thermistors, LEVEL and clock) according to the table below.

LED Indicator	Condition for LED to be ON
STBY LED	Room thermistor ≠ 25°c
OPER LED	Indoor coil thermistor ≠ 25°c
TIMER LED	Outdoor coil thermistor ≠ 25°c
FILTER LED	Clock
COOL LED	LEVEL 2&3
HEAT LED	LEVEL 4

h. STEP 7: TIMING RESET TEST (WATCH DOG).

The test purpose is to verify that the CPU rise time after power failure is between 1 to 3 sec, test results are indicated on the LEDS : STAND-BY,OPER, TIMER and FILTER turning ON one by one.

The results of the test are coded as follows:

Pass condition:

1 sec - STAND-BY and OPER are turned ON

2 sec - STAND-BY, OPER and TIMER are turned ON

Fail condition:

0 sec - STAND-BY is turned ON

3 sec - STAND-BY, OPER, TIMER and FILTER are turned ON

When the timing reset test is completed, the next test will start automatically.

i. STEP 8: MEMORY TEST (EEPROM)

The test purpose is to check if the memory is functioning correctly. The test result is reported by using the STAND-BY and FILTER LEDS:

LED Indicator	Condition for LED to be ON
STAND-BY LED	Test passed
FILTER LED	Test failed

AT THIS POINT THE SELF-TEST IS COMPLETED.

In order to terminate Self-Test mode the User can change the unit setting from COOL Mode, LOW FAN to COOL Mode, MED FAN or to wait without using the remote control for 60 sec.

Values of Sensors Temperature VS. Voltage (DC)

Temp. (°C)	Voltage (V)	Temp. (°C)	Voltage (V)	Temp. (°C)	Voltage (V)	Temp. (°C)	Voltage (V)
-20	4,554	2	3.744	24	2.555	46	1.487
-19	4,529	3	3.695	25	2.5	47	1.447
-18	4,502	4	3.646	26	2.445	48	1.409
-17	4,475	5	3.595	27	2.391	49	1.371
-16	4.446	6	3.544	28	2.338	50	1.334
-15	4.417	7	3.492	29	2.284	51	1.298
-14	4.386	8	3.439	30	2.232	52	1.263
-13	4.354	9	3.386	31	2.18	53	1.228
-12	4.322	10	3.332	32	2.128	54	1.195
-11	4.287	11	3.278	33	2.077	55	1.162
-10	4.252	12	3.223	34	2.027	56	1.13
-9	4.216	13	3.168	35	1.978	57	1.099
-8	4.178	14	3.113	36	1.929	58	1.069
-7	4.14	15	3.058	37	1.881	59	1.04
-6	4.1	16	3.002	38	1.834	60	1.011
-5	4.059	17	2.946	39	1.798	61	0.983
-4	4.017	18	2.89	40	1.742	62	0.956
-3	3.974	19	2.833	41	1.698	63	0.929
-2	3.93	20	2.777	42	1.654	64	0.904
-1	3.885	21	2.722	43	1.611	65	0.879
0	3.839	22	2.666	44	1.569	66	0.854
1	3.792	23	2.61	45	1.527	67	0.831

11.16 System Diagnostics

Pressing Mode button for 5-10 seconds in SB or any other operation mode will activate the DIAGNOSTICS mode, acknowledged by 3 short beeps and lighting of COOL and HEAT LEDs.
In DIAGNOSTICS mode, system failures will be indicated by the blinking of HEAT & COOL LEDs.
The coding method is as follows:

- HEAT LED blinks 5 times in 5 seconds, and then turns off for the next 5 seconds.
- COOL LED blinks during the same 5 seconds according to the following table:

No.	Problem	1	2	3	4	5
1	RT1 is disconnected	○	●	●	●	●
2	RT1 is shorted	○	●	●	●	○
3	RV fault	○	●	●	○	●
4	RT2 is disconnected	●	○	●	●	●
5	RT2 is shorted	●	○	●	●	○
6	(Reserved)	●	○	●	○	●
7	RT2 temp reading doesn’t change	●	○	●	○	○
8	RT3 is disconnected	●	●	○	●	●
9	RT3 is shorted	●	●	○	●	○
10	(Reserved)	●	●	○	○	●
11	RT3 temp reading doesn’t change	●	●	○	○	○
12	RT2 & RT3 temp reading doesn’t change	●	○	○	○	○

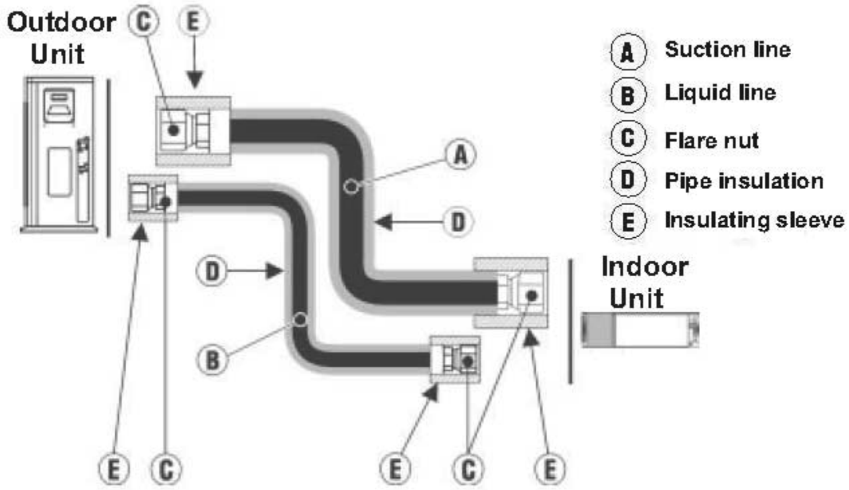
LEGEND

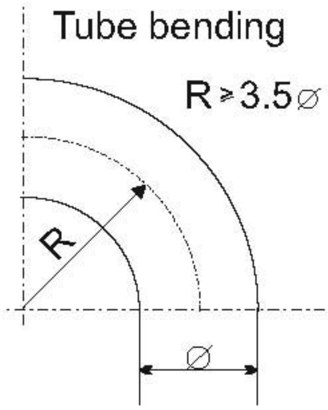
○ - ON, ● - OFF

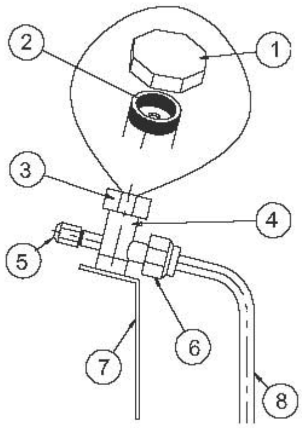
NOTES

1. **If faults occur in more than one thermistor (except case number 12 in table above), only one fault will be indicated according to the following order: RT3, RT2, RT1.**
2. **A/C will return to normal mode when sending a command by the R/C during system DIAGNOSTICS mode. If the command from the R/C contains a Group ID, the ID will become the new Group ID of the ELCON unit.**

12. TUBING CONNECTIONS



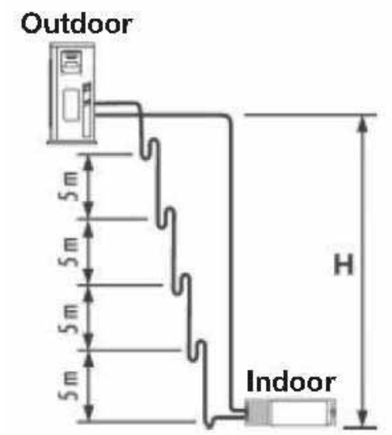




TUBE (Inch) / TORQUE (Nm)	¼"	⅜"	½"	⅝"	¾"
Flare Nuts	11-13	40-45	60-65	70-75	80-85
Valve Cap	13-20	13-20	18-25	18-25	40-50
Service Port Cap	11-13	11-13	11-13	11-13	11-13

1. Valve Protection Cap-end
2. Refrigerant Valve Port (use Allen wrench to open/close)
3. Valve Protection Cap
4. Refrigerant Valve
5. Service Port Cap
6. Flare Nut
7. Unit Back Side
8. Copper Tube

When the outdoor unit is installed above the indoor unit an oil trap is required every 5m along the suction line at the lowest point of the riser. Incase the indoor unit is installed above the outdoor, no trap is required.



13. TROUBLESHOOTING

ELECTRICAL & CONTROL TROUBLESHOOTING

ATTENTION : check for broken or loose cable lugs first.

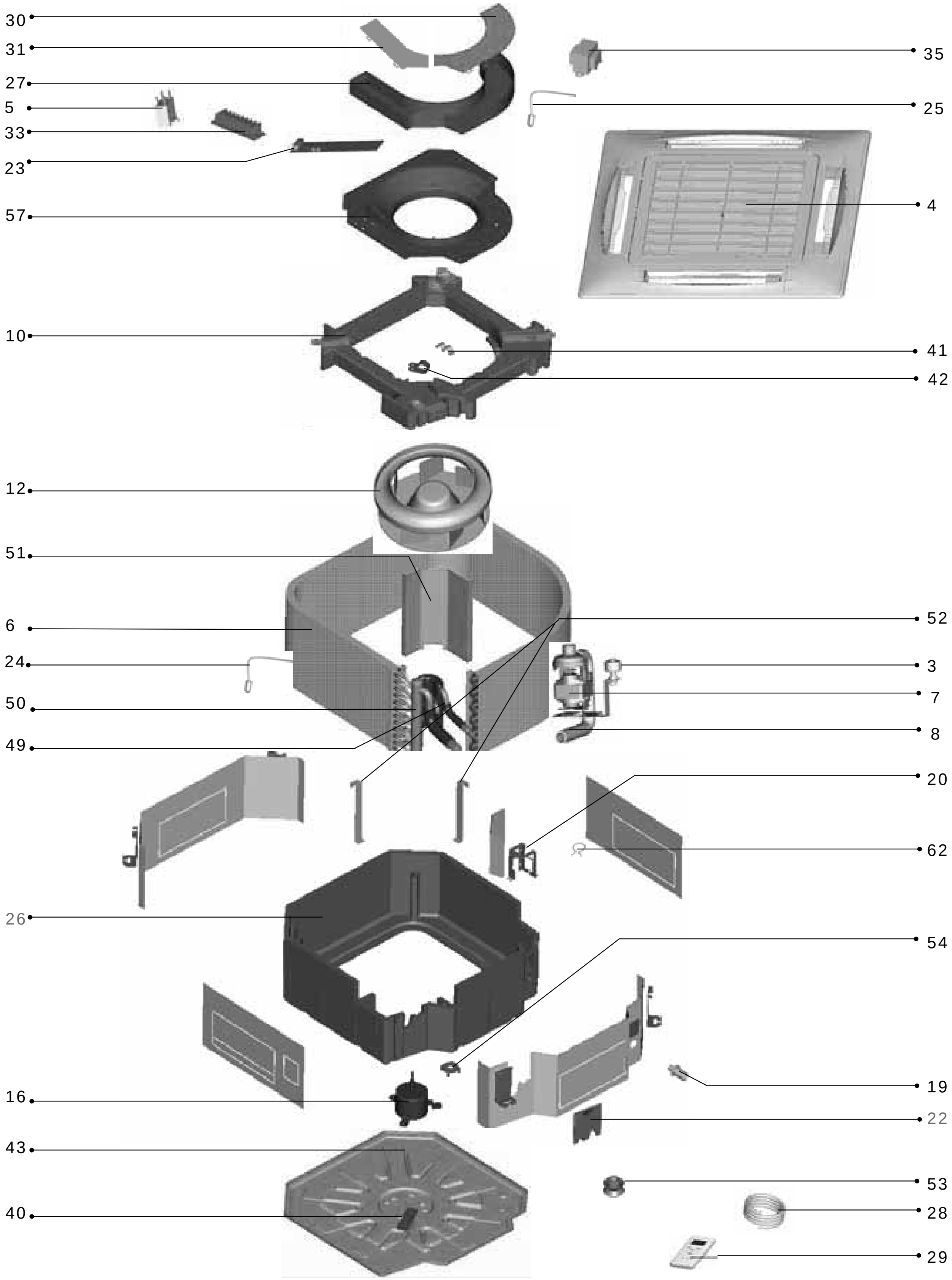
NO	SYMPTON	PROBABLE CAUSE	CORRECTIVE ACTION
1.	The power supply indicator (red led) doesn't light up.	There is no correct voltage between the line and neutral terminals on main P.C.B.	-If the voltage is low repair power supply. -If there is no voltage repair general wiring. -If there is correct voltage replace main or display P.C.B'S
2.	The operating indicator (green led) does not light up.	The remote control batteries are discharged	-Replace batteries of the remote control
3.	The operating indicator (green led) does not light up when starting from unit..	Check main P.C.B and display P.C.B.	-Replace P.C.B if necessary.
4.	The indoor fan does not function correctly.	Check the voltage between indoor fan terminals on the main P.C.B	- If there is voltage replace capacitor or motor.
5.	The outdoor fan does not function correctly.	Check the voltage between indoor fan terminals on the main P.C.B. There is voltage between outdoor fan terminals on the outdoor unit. There is no voltage between outdoor fan terminals on the outdoor unit.	- If there is no voltage replace main P.C.B - Replace capacitor or motor. - Check and repair electrical wiring between indoor and outdoor units.
6.	The compressor does not start up.	Check voltage on compressor terminals on the outdoor unit. (with ampmeter) Check if there is correct voltage between compressor terminals on the outdoor unit.	-If no voltage replace main P.C.B. - If low voltage repair power supply. -If the voltage corrrect replace capacitor or compressor. -If there is no voltage repair electrical wiring between indoor and outdoor units.
7.	The refrigeration system does not function correctly.	Check for leaks or restrictions, with ampmeter, pressure guage or surface thermometer.	- Repair refrigeration system and charge refrigerant if necessary.
8.	No cooling or heating only indoor fan works.	Outdoor fan motor faulty or other fault caused, compresssor overload protection cut out.	-Replace P.C.B. - Outdoor fan blocked remove obstructions.

ATTENTION : check for broken or loose cable lugs first

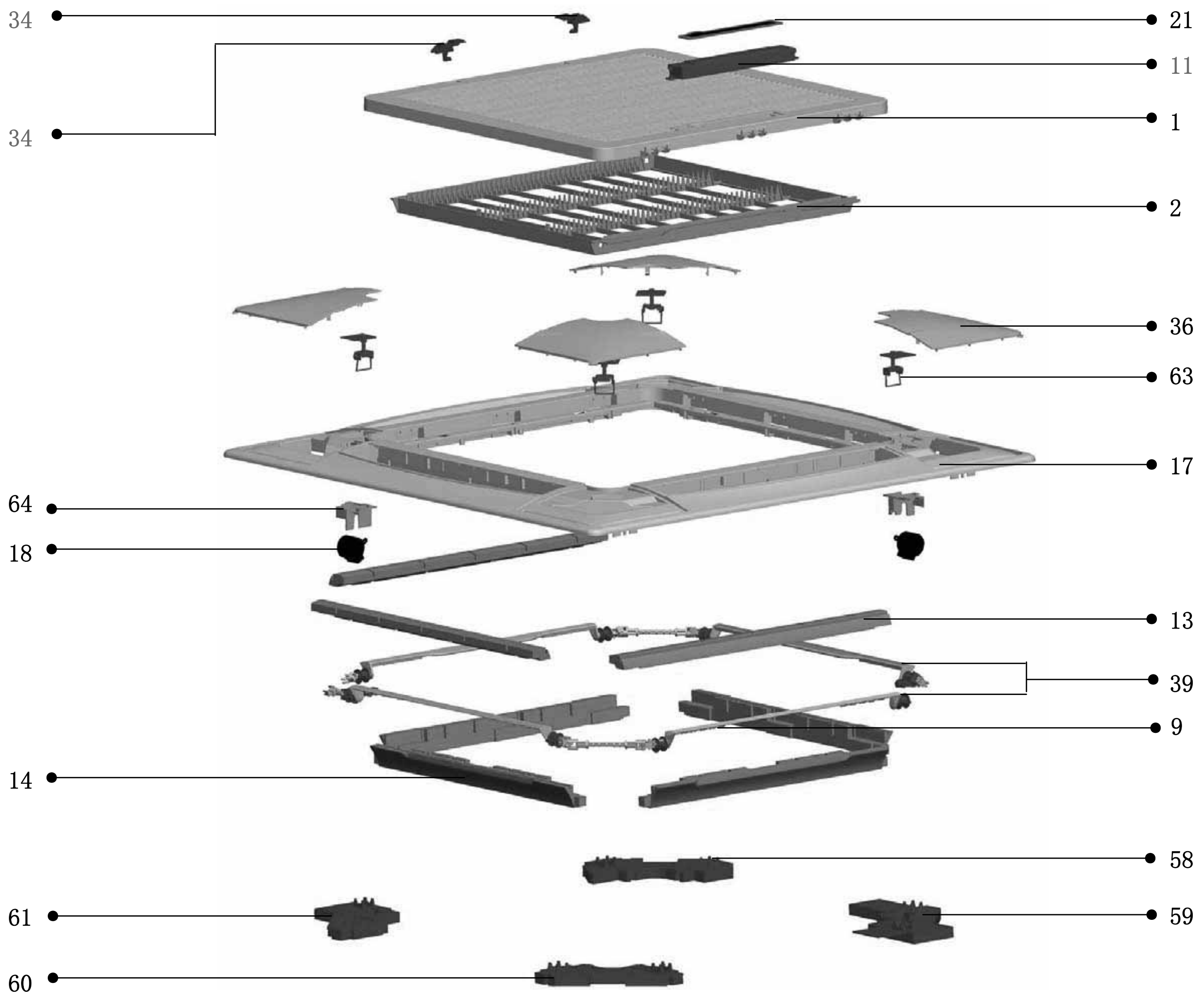
NO	SYMPTON	PROBABLE CAUSE	CORRECTIVE ACTION
9.	Only indoor fan and compressor working.	Outdoor fan blocked.	- Remove obstructions.
10.	Only indoor fan working.	-Run capacitor of outdoor fan motor faulty. -Windings of outdoor fan are shorted.	- Replace capacitor. -Replace motor.
11.	No cooling or heating takes place, indoor and outdoor fans working.	- Overload safety device on compressor is cut out (low voltage or high temperature) - Compressor run capacitor faulty. - Compressor windings are shorted.	- Check for proper voltage, switch off power and try again after one hour. - Replace compressor capacitor. - Replace compressor.
12.	No air supply at indoor unit, compressor operates.	-Indoor fan motor is blocked or turns slowly. -indoor fan run capacitor faulty. - motor windings are shorted.	- Check voltage,repair wiring if necessary. -Check fan wheel if it is tight enough on motor shaft,tighten if necessary. -Replace indoor fan motor.
13.	Partial, limited air supply at indoor indoor unit.	Lack of refrigerant (will accompanied by whisteling noise) cause ice formation on indoor unit coil in cooling mode.	-Charge the unit after localizing leak.
14.	Water accumulates and overflow from indoor unit section.	Drain tube or spout of drain pan clogged.	-Disasemble plastic drain tube from spout of indoor unit drain pan.
15.	Water dripping from outdoor unit base. (in heating mode)	Water drain outlet is clogged.	-Open outdoor unit cover clean out water outlet ,clean the base inside througly.
16.	Freeze-up of outdoor coil in heating mode, poor heating effect in room, indoor fan operates.	-Faulty outdoor thermistor. -Faulty control cable. - Outdoor temperature is too low (below -10°C) -Outdoor unit air outlet is blocked.	-Replace thermistor. - Repair control cable. - Shut unit off, outdoor temp. is below design conditions and cannot function properly. -Remove obstructions.

14. EXPLODED VIEWS AND SPARE PARTS LISTS

14.1 Indoor Unit: CKF024, CKF030, CKF036, CKF045 (unit`s)



14.2 Indoor Unit: CKF024, CKF030, CKF036, CKF045 (panel`s)



14.3 Indoor Unit: CKF024

No.	Item	Description	Quan.
1	P0000371694	Grill/Airwell	1
2	P0000371695	Filter /NKN	1
3	202301300044	Water-Level Switch Assy.	1
4	201109990016	Front panel/Airwell	1
5	202401100017	3.5uF/450V P2 Capacitor for fan motor	1
6	201542590007	Evaporator Assy./KN24RC, R410A	1
7	202400610001	Pump	1
8	202742000006	Drain Pipe	1
9	P0000146588	Flap	4
10	202242500075	Drain pan Assy.	1
11	P0000402822	Display Cover	1
12	201142000003	Fan	1
13	P0000146552	EPS 1 / Front Frame	4
14	P0000146553	EPS 2 / Front Frame	4
16	202400400439	Motor/Indoor unit	1
17	P0000146543	Front Frame	1
18	202400100007	Step Motor	2
19	201142000002	Connecting pipe/Drain pipe	1
20	201242000003	Fixing Plate/Pump Assy.	1
21	467300128R	Display Board/CN	1
22	201242800078	Connection Support	1
23	467300217R	Controller/ KN fixed RPM new	1
24	4523277	ICT SENSOR	1
25	4523278	RW SENSOR	1
26	202242500076	EPS/Air Housing assy.	1
27	201242800091	Electric control box welded assembly	1
28	4520416	Defrost cableEXPORT UNITS	1
29	467200012R	Remote controller RC-4 (RCLD 433C) With Back Label	1
30	201242800085	cover I/Electric control box	1
31	201242800084	cover II/Electric control box	1
33	202301450029	Terminal Block	1
33	202301450030	6 Poles Terminal Block	1
34	P0000146568	Grill Clasp switch 1	1
34	P0000146569	Grill Clasp switch 2	1
35	4523162	TRANSFORMER ASSY.	1
36	P0000146557	Cover /Front Plate	4
39	P0000146556	Flap swing Assy.	1
40	201242500081	plate/wire	1
41	201242800082	tandem/wire	1
42	201102020216	bipitch wire clip	1
43	201242500080	Welded assembly/Base pan	1
49	201642590015	Liquid Pipe Assy. /NKN24	1
50	201642590022	Gas Pipe Assy./NKN24	1
51	201242500082	Fixing Plate/Evaporator	1
52	201242500083	Hook/Evaporator	3
53	202742000002	Cushion Rubber/Pump	3
54	201242000008	fan fixer	1
57	201142800079	Air Intake Assy.	1
58	P0000146558	Cover1 /Front Plate	1
59	P0000146559	Cover2 /Front Plate	1
60	P0000146560	Cover3 /Front Plate	1
61	P0000146561	Cover4 /Front Plate	1
62	201242000013	Grommet/Drain Pipe	1
63	P0000146555	Hook Assy.	4
64	P0000146594	Support/Step motor	2

14.4 Indoor Unit: CKF030

No.	Item	Description	
1	P0000371694	Grill/Airwell	1
2	P0000371695	Filter /NKN	1
3	202301300044	Water-Level Switch Assy.	1
4	201109990016	Front panel/Airwell	1
5	202401100017	3.5uF/450V P2 Capacitor for fan motor	1
6	201542690004	Evaporator Assy./KN30RC, R410A	1
7	202400610001	Pump	1
8	202742000006	Drain Pipe	1
9	P0000146588	Flap	4
10	202242500075	Drain pan Assy.	1
11	P0000402822	Display Cover	1
12	201142000003	Fan	1
13	P0000146552	EPS 1 / Front Frame	4
14	P0000146553	EPS 2 / Front Frame	4
16	202400410831	Motor/Indoor unit	1
17	P0000146543	Front Frame	1
18	202400100007	Step Motor	2
19	201142000002	Connecting pipe/Drain pipe	1
20	201242000003	Fixing Plate/Pump Assy.	1
21	467300128R	Display Board/CN	1
22	201242800078	Connection Support	1
23	467300217R	Controller/ KN fixed RPM new	1
24	4523277	ICT SENSOR	1
25	4523278	RW SENSOR	1
26	202242500076	EPS/Air Housing assy.	1
27	201242800091	Electric control box welded assembly	1
28	4520416	Defrost cable EXPORT UNITS	1
29	467200012R	Remote controller RC-4 (RCLD 433C) With Back Label	1
30	201242800085	cover I/Electric control box	1
31	201242800084	cover II/Electric control box	1
33	202301450029	Terminal Block	1
33	202301450030	6 Poles Terminal Block	1
34	P0000146568	Grill Clasp switch 1	1
34	P0000146569	Grill Clasp switch 2	1
35	4523162	TRANSFORMER ASSY.	1
36	P0000146557	Cover /Front Plate	4
39	P0000146556	Flap swing Assy.	1
40	201242500081	plate/wire	1
41	201242800082	tandem/wire	
42	201102020216	bipitch wire clip	
43	201242500080	Welded assembly/Base pan	1
44	201642690005	Liquid Pipe Assy. /NKN30	1
50	201642590022	Gas Pipe Assy./NKN24	1
51	201242500082	Fixing Plate/Evaporator	1
52	201242500083	Hook/Evaporator	3
53	202742000002	Cushion Rubber/Pump	3
54	201242000008	fan fixer	1
57	201142800079	Air Intake Assy.	1
58	P0000146558	Cover1 /Front Plate	1
59	P0000146559	Cover2 /Front Plate	1
60	P0000146560	Cover3 /Front Plate	1
61	P0000146561	Cover4 /Front Plate	1
62	201242000013	Grommet/Drain Pipe	1
63	P0000146555	Hook Assy.	4
64	P0000146594	Support/Step motor	

14.5 Indoor Unit: CKF036

No.	Item	Description	Quan.
1	P0000371694	Grill/Airwell	1
2	P0000371695	Filter /NKN	1
3	202301300044	Water-Level Switch Assy.	1
4	201109990016	Front panel/Airwell	1
5	202401100017	3.5uF/450V P2 Capacitor for fan motor	1
6	201542690005	Evaporator Assy./NKN36	1
7	202400610001	Pump	1
8	202742000006	Drain Pipe	1
9	P0000146588	Flap	4
10	202242800075	Drain pan Assy	1
11	P0000402822	Display Cover	1
12	201142000601	Centrifugal Fan	1
13	P0000146552	EPS 1 / Front Frame	4
14	P0000146553	EPS 2 / Front Frame	4
16	202400410832	Motor/Indoor unit	1
17	P0000146543	Front Frame	1
18	202400100007	Step Motor	2
19	201142000002	Connecting pipe/Drain pipe	1
20	201242000605	Fixing Plate/Pump Assy.	1
21	467300128R	Display Board/CN	1
22	201242800078	Connection Support	1
23	467300217R	Controller/ KN fixed RPM new	1
24	4523277	ICT SENSOR	1
25	4523278	RW SENSOR	1
26	202242800076	EPS/Air Housing assy.	1
27	201242800091	Electric control box welded assembly	1
28	4520416	Defrost cable EXPORT UNITS	1
29	467200012R	Remote controller RC-4 (RCLD 433C) With Back Label	1
30	201242800085	cover I/Electric control box	1
31	201242800084	cover II/Electric control box	1
33	202301450029	Terminal Block	1
33	202301450030	6 Poles Terminal Block	1
34	P0000146568	Grill Clasp switch 1	1
34	P0000146569	Grill Clasp switch 2	1
35	4523162	TRANSFORMER ASSY.	1
36	P0000146557	Cover /Front Plate	4
39	P0000146556	Flap swing Assy.	1
40	201242500081	plate/wire	1
41	201242800082	tandem/wire	1
42	201102020216	bipitch wire clip	1
43	201242800081	base pan welded assembly	1
49	201642690006	Liquid Pipe Assy.NKN36	1
50	201642690007	Gas Pipe Assy./NKN36	1
51	201242800086	Fixing Plate/Evaporator	1
52	201242800087	Hook/Evaporator	3
53	202742000002	Cushion Rubber/Pump	3
54	201242000008	fan fixer	1
57	201142690001	Air Intake Assy.	1
58	P0000146558	Cover1 /Front Plate	1
59	P0000146559	Cover2 /Front Plate	1
60	P0000146560	Cover3 /Front Plate	1
61	P0000146561	Cover4 /Front Plate	1
62	201242000013	Grommet/Drain Pipe	1
63	P0000146555	Hook Assy.	4
64	P0000146594	Support/Step motor	2

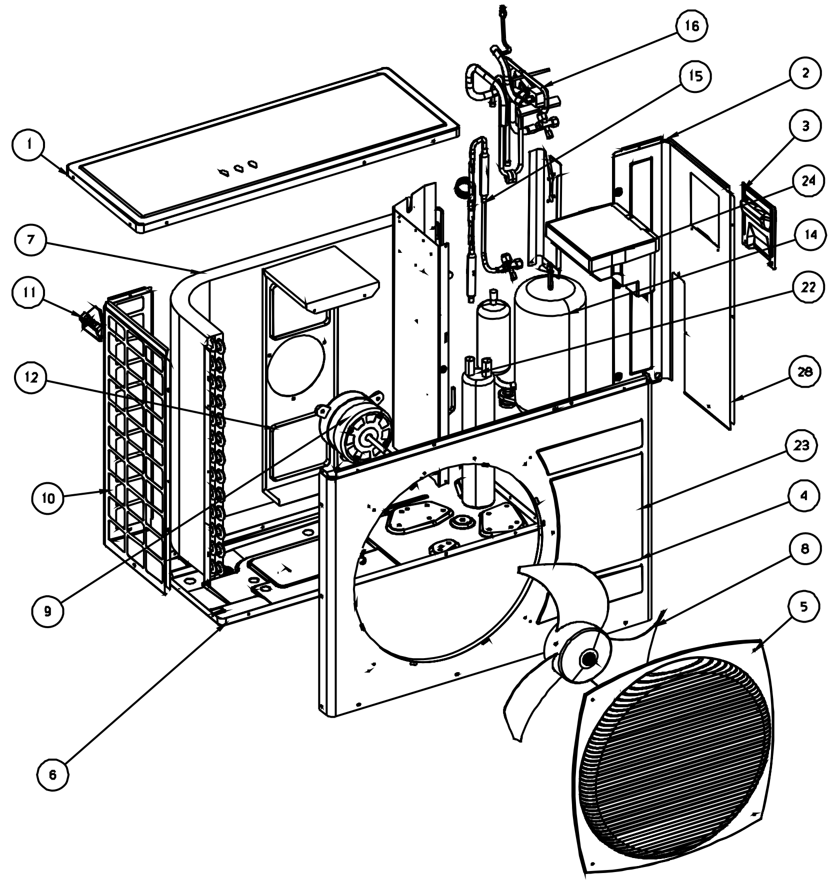
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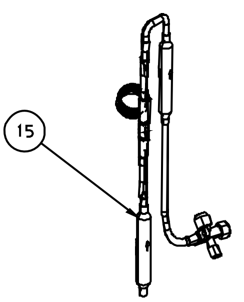
14.6 Indoor Unit: CKF045

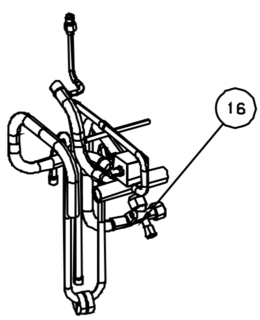
No.	Item	Description	Quan.
1	P0000371694	Grill/Airwell	1
2	P0000371695	Filter /NKN	1
3	202301300044	Water-Level Switch Assy.	1
4	201109990016	Front panel/Airwell	1
5	202401100961	5.0uF/450V P2 Capacitor for fan motor	1
6	201542890004	Evaporator Assy./NKN45	1
7	202400610001	Pump	1
8	202742000006	Drain Pipe	1
9	P0000146588	Flap	4
10	202242800075	Drain pan Assy	1
11	P0000402822	Display Cover	1
12	201142000601	Centrifugal Fan	1
13	P0000146552	EPS 1 / Front Frame	4
14	P0000146553	EPS 2 / Front Frame	4
16	202400420902	Motor/Indoor unit	1
17	P0000146543	Front Frame	1
18	202400100007	Step Motor	2
19	201142000002	Connecting pipe/Drain pipe	1
20	201242000605	Fixing Plate/Pump Assy.	1
21	467300128R	Display Board/CN	1
22	201242800078	Connection Support	1
23	467300217R	Controller/ KN fixed RPM new	1
24	4523277	ICT SENSOR	1
25	4523278	RW SENSOR	1
26	202242800076	EPS/Air Housing assy.	1
27	201242800091	Electric control box welded assembly	1
28	4520416	Defrost cable EXPORT UNITS	1
29	467200012R	Remote controller RC-4 (RCLD 433C) With Back Label	1
30	201242800085	cover I/Electric control box	1
31	201242800084	cover II/Electric control box	1
33	202301450029	Terminal Block	1
33	202301450030	6 Poles Terminal Block	1
34	P0000146568	Grill Clasp switch 1	1
34	P0000146569	Grill Clasp switch 2	1
35	4523162	TRANSFORMER ASSY.	1
36	P0000146557	Cover /Front Plate	4
39	P0000146556	Flap swing Assy.	1
40	201242500081	plate/wire	1
41	201242800082	tandem/wire	1
42	201102020216	bipitch wire clip	1
43	201242800081	base pan welded assembly	1
49	201642890013	Liquid Pipe Assy. /NKN45	1
50	201642790017	Gas Pipe Assy./NKN45	1
51	201242800086	Fixing Plate/Evaporator	1
52	201242800087	Hook/Evaporator	3
53	202742000002	Cushion Rubber/Pump	3
54	201242000008	fan fixer	1
57	201142690001	Air Intake Assy.	1
58	P0000146558	Cover1 /Front Plate	1
59	P0000146559	Cover2 /Front Plate	1
60	P0000146560	Cover3 /Front Plate	1
61	P0000146561	Cover4 /Front Plate	1
62	201242000013	Grommet/Drain Pipe	1
63	P0000146555	Hook Assy.	4
64	P0000146594	Support/Step motor	2

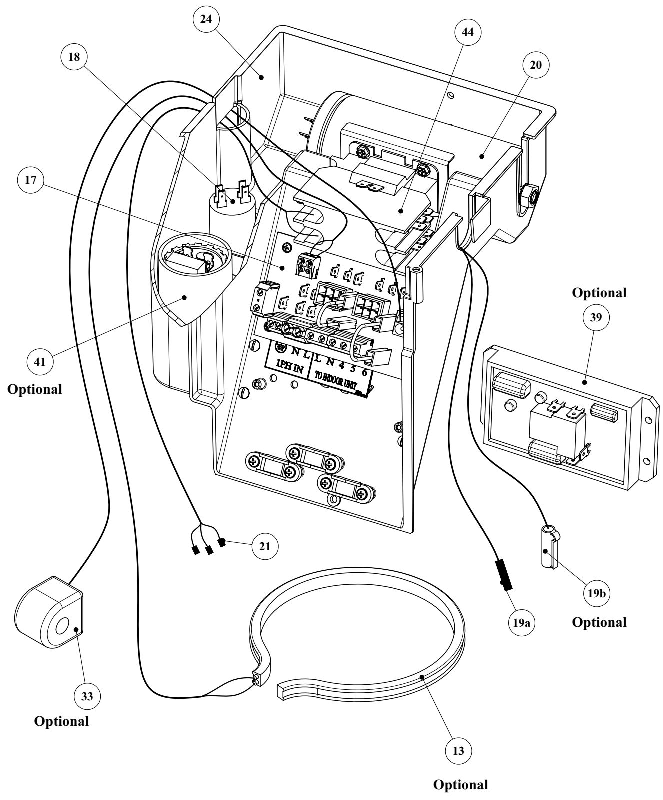
CONTENTS

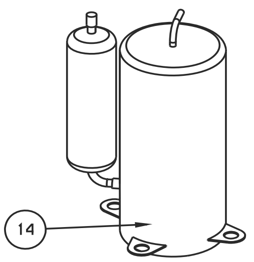
14.7 Outdoor Unit: GCN 24 RC

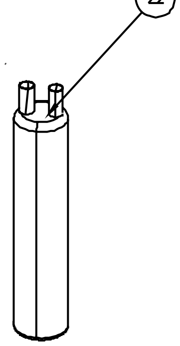








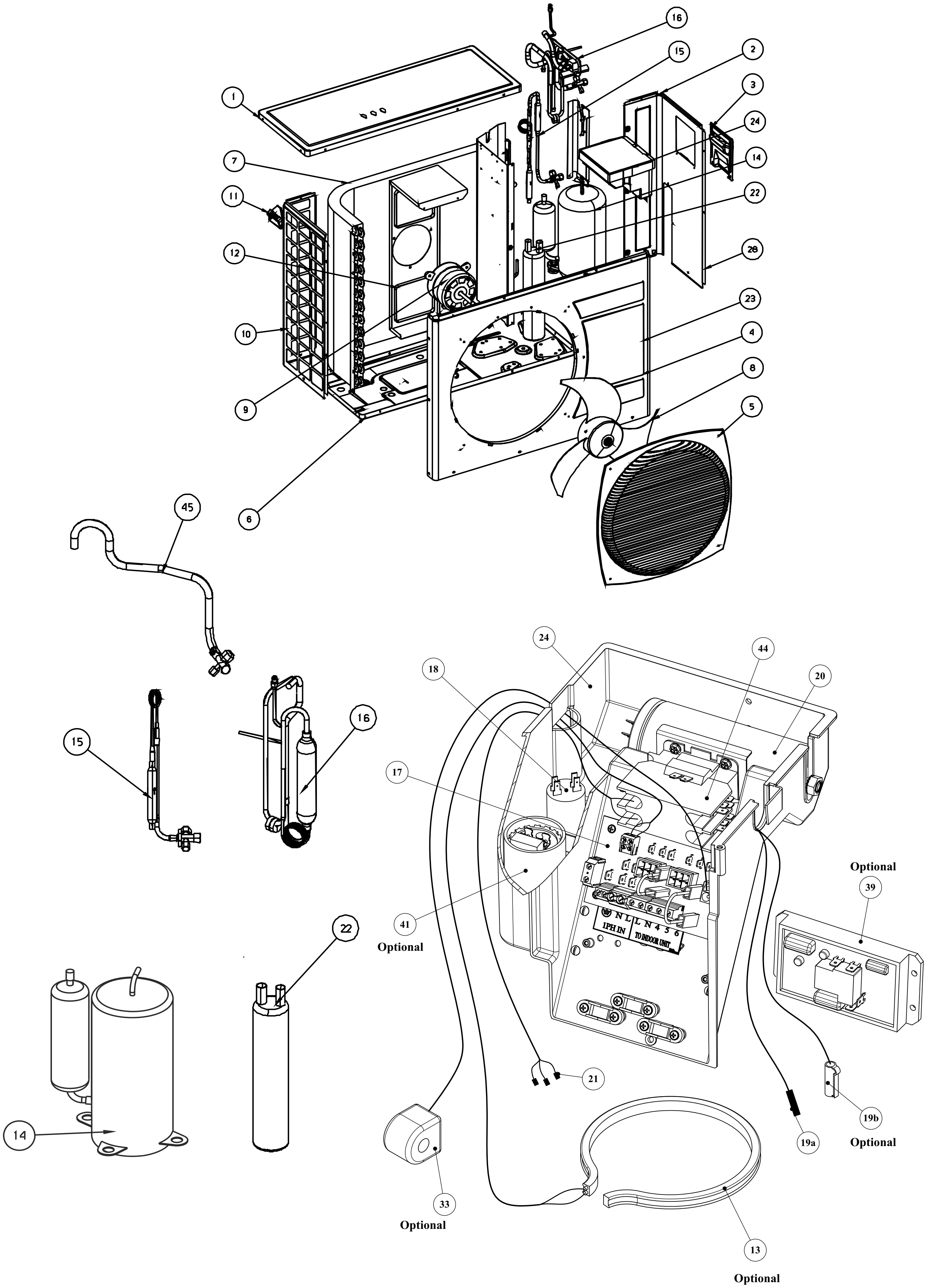




14.8 Indoor Unit: GCN 24 RC

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	433280	SIDE PANEL OU7-24 R410A	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	439329	FRONT COVER/CO' OU7-35/90 E	1
5	437091	OU SQUARE FAN GUARD	1
6	433294	NEW BASE ASSY OU 2005 EXPORT	1
7	433285	COIL OU7-24 GR/HDR	1
8	4529604	AXIAL FAN D493*143	1
9	434211	MOTOR 70W,2S,OU7/8	1
10	433281	SIDE GUARD OU7-24 R410A	1
11	436358	OU LEADING HANDLE	1
12	439342	MOTOR SUPPORT OU7	1
13	190443	HEATER CRANKCASE MITSUBISHI	1
14	433293	COMPRESSOR NN27VBAMT	1
15	433288	CAPILLARY ASSY OU7-24 R410A	1
16	433291	TUBING ASSY OU7 R410A	1
17	413496	BOARD TPHN 5F (RoHS)	1
18	442007	CAPACITOR 6mf 450V P1/P2	1
19a	434716	THERMISTOR+CAP WTH CONNECTOR	1
20	442016	CAPACITOR 55mF 450V P1/P2	1
21	438627	COMPRESSOR WIRING TPHN-5F	1
22	402283	SUCTION ACCUMULATOR 3"x5/8"	1
24	437229	ELECTRICAL BOX TPHN	1
33	442520	VALVE COIL L700 MOLEX-DUNAN	1
44	192207	CONTACTOR 230V, 40A	1

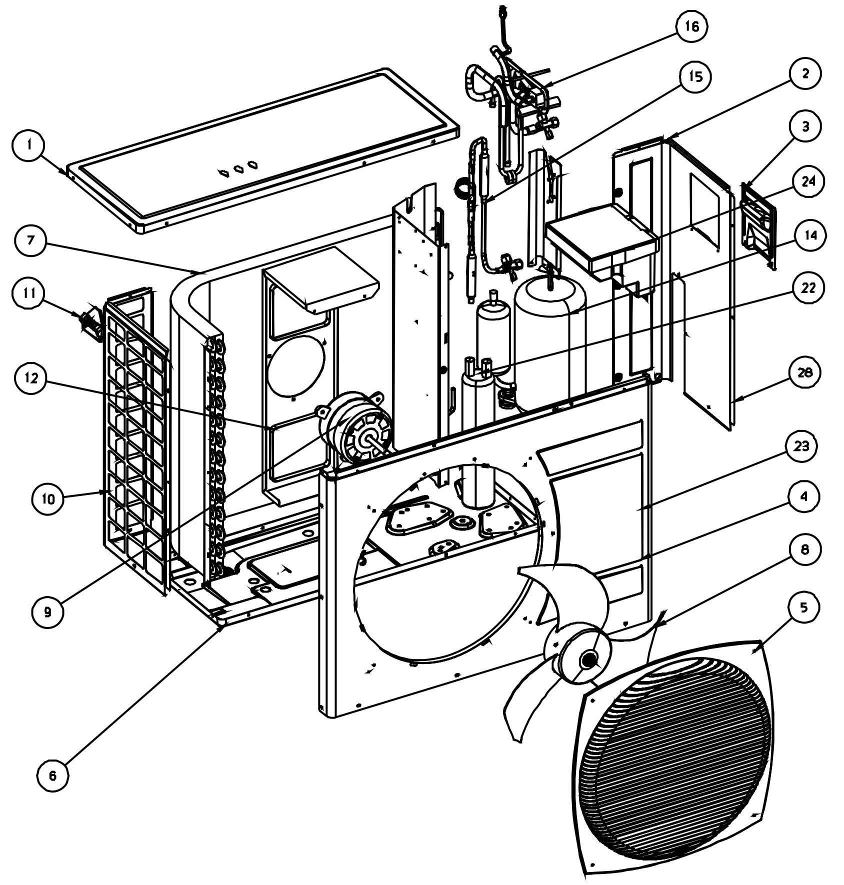
14.9 Outdoor Unit: GCN 24

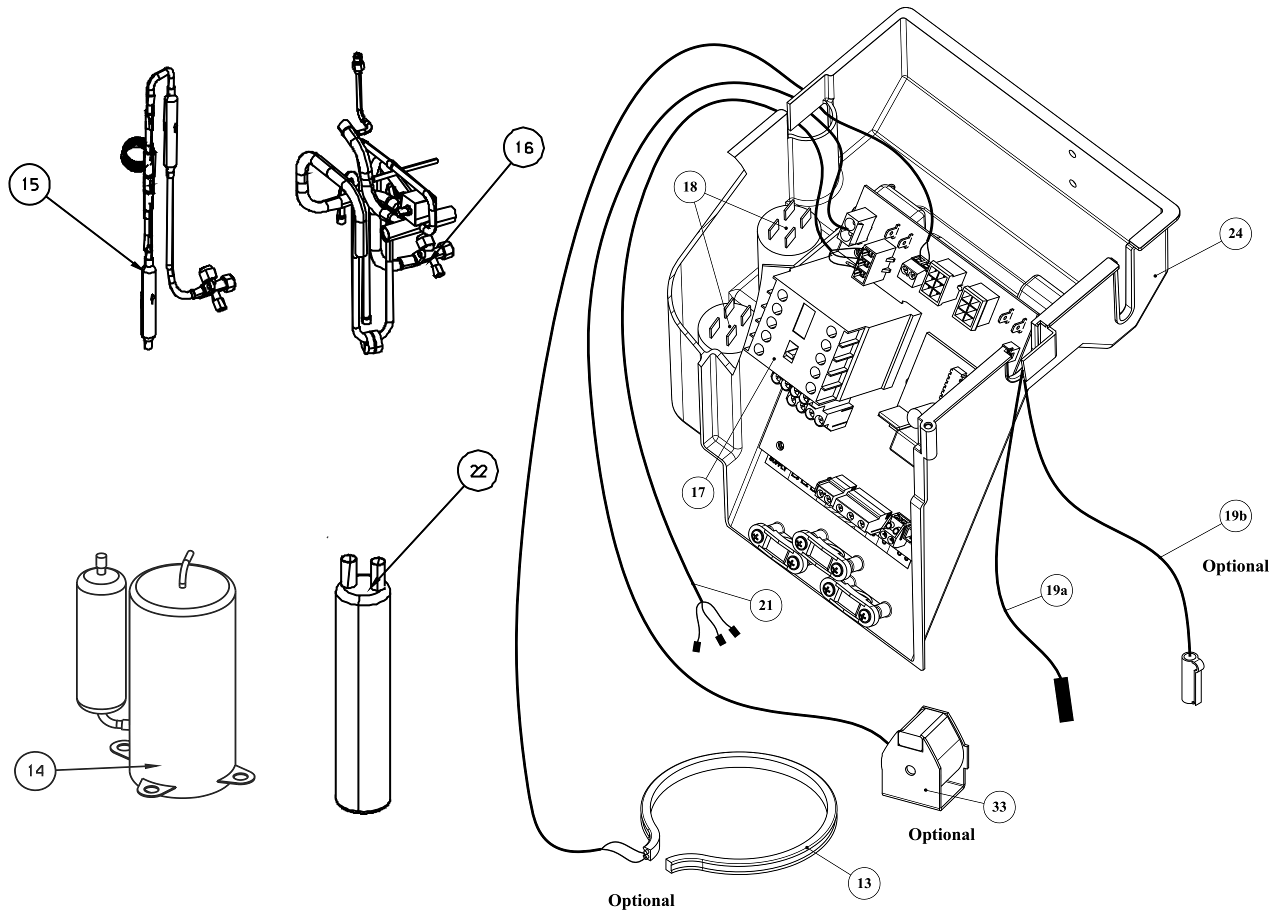


14.10 Outdoor Unit: GCN 24

No.	Item	Description	
1	437045	UPPER COVER EL13 OU LARGE	1
2	433280	SIDE PANEL OU7-24 R410A	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	439329	FRONT COVER/CO' OU7-35/90 EL13	1
5	437091	OU SQUARE FAN GUARD	1
6	433705	NEW BASE ASSY OU 2005 LOCAL R410A	1
7	433846	COIL OU7-24 ST	1
8	4529604	AXIAL FAN D493*143	1
9	434211	MOTOR 70W,2S,OU7/8	1
10	433281	SIDE GUARD OU7-24 R410	1
11	436358	OU LEADING HANDLE	1
12	439342	MOTOR SUPPORT OU7	1
13	190443	HEATER CRANKCASE MITSUBISHI	1
14	433293	COMPRESSOR NN27VBAMT	1
15	433845	CAPILLARY ASSY OU7-24 ST R410A	1
16	433817	TUBING ASSY OU7 ST R410A	1
17	413496	BOARD TPHN 5F (RoHS)	1
18	442007	CAPACITOR 6mf 450V P1/P2	1
19a	434716	THERMISTOR+CAP WTH CONNECTOR	1
20	442016	CAPACITOR 55mF 450V P1/P2	1
21	438627	COMPRESSOR WIRING TPHN-5F	1
22	402283	SUCTION ACCUMULATOR 3"x5/8"	1
24	437229	ELECTRICAL BOX TPHN	1
44	192207	CONTACTOR 230V, 40A	1
45	433847	GAS VALVE ASSY OU7 ST R410A	1

14.11 Outdoor Unit: GCN 24 RCT

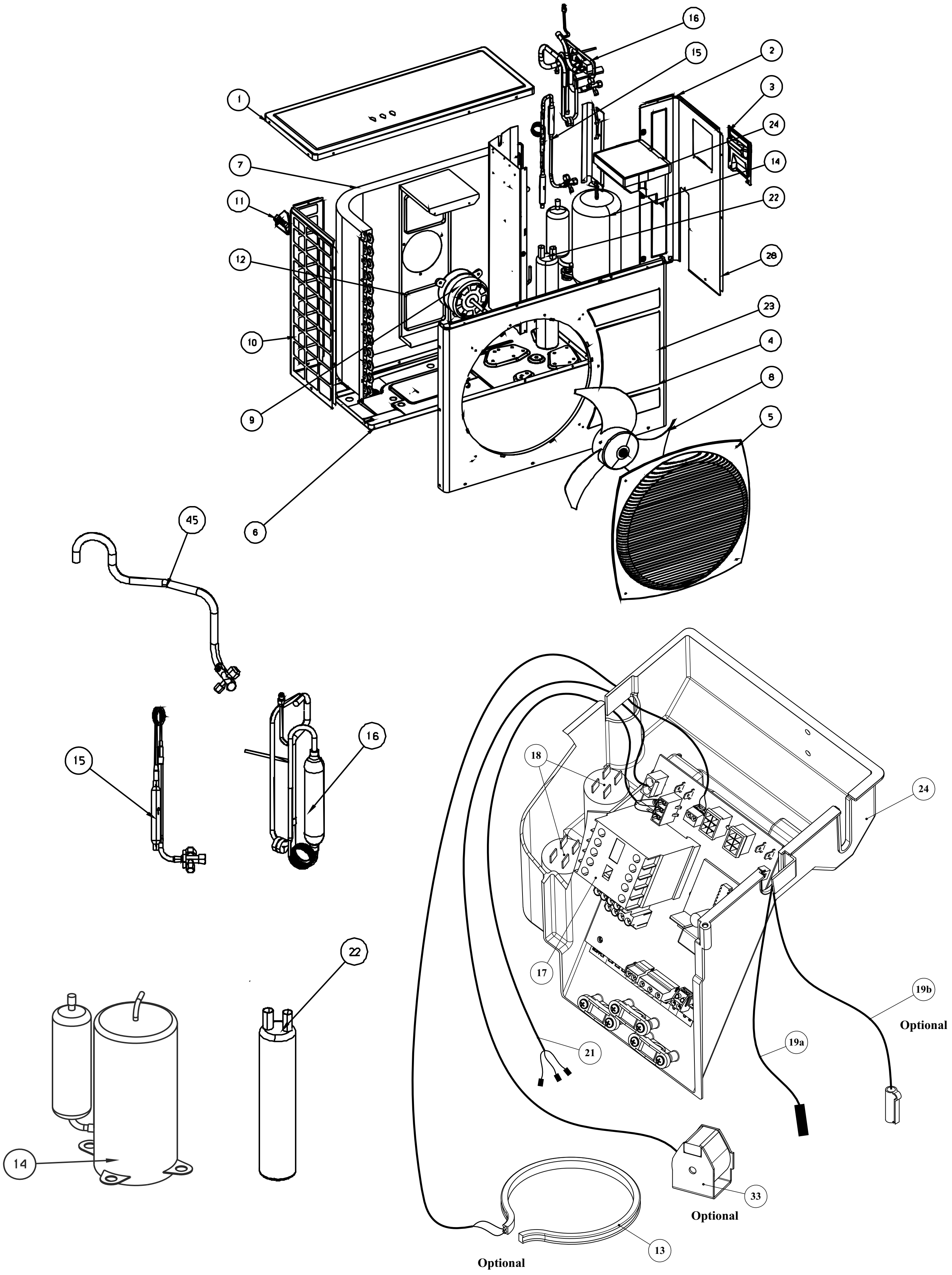




14.12 Outdoor Unit: GCN 24 RCT

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	433280	SIDE PANEL OU7-24 R410A	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	439329	FRONT COVER/CO' OU7-35/90 EL13	1
5	437091	OU SQUARE FAN GUARD	1
6	433294	NEW BASE ASSY OU 2005 EXPORT R410A	1
7	433285	COIL OU7-24 GR/HDR	1
8	4529604	AXIAL FAN D493*143	1
9	434211	MOTOR 70W,2S,OU7/8	1
10	433281	SIDE GUARD OU7-24 R410	1
11	436358	OU LEADING HANDLE	1
12	439342	MOTOR SUPPORT OU7	1
13	190443	HEATER CRANKCASE MITSUBISHI	1
14	433753	COMPRESSOR NN27YDAMT	1
15	433288	CAPILLARY ASSY OU7-24 R410A	1
16	433291	TUBING ASSY OU7 R410A	1
17	438888	BOARD TPHN 3E 9A (RoHS)	1
18	442007	CAPACITOR 6mf 450V P1/P2	1
19a	434716	THERMISTOR+CAP WTH CONNECTOR	1
21	437280	COMPRESSOR WIRING OU10-3PH MIT	1
22	402283	SUCTION ACCUMULATOR 3"x5/8"	1
24	437229	ELECTRICAL BOX TPHN	1
33	442520	VALVE COIL L700 MOLEX-DUNAN	1

14.13 Outdoor Unit: GCN 24T

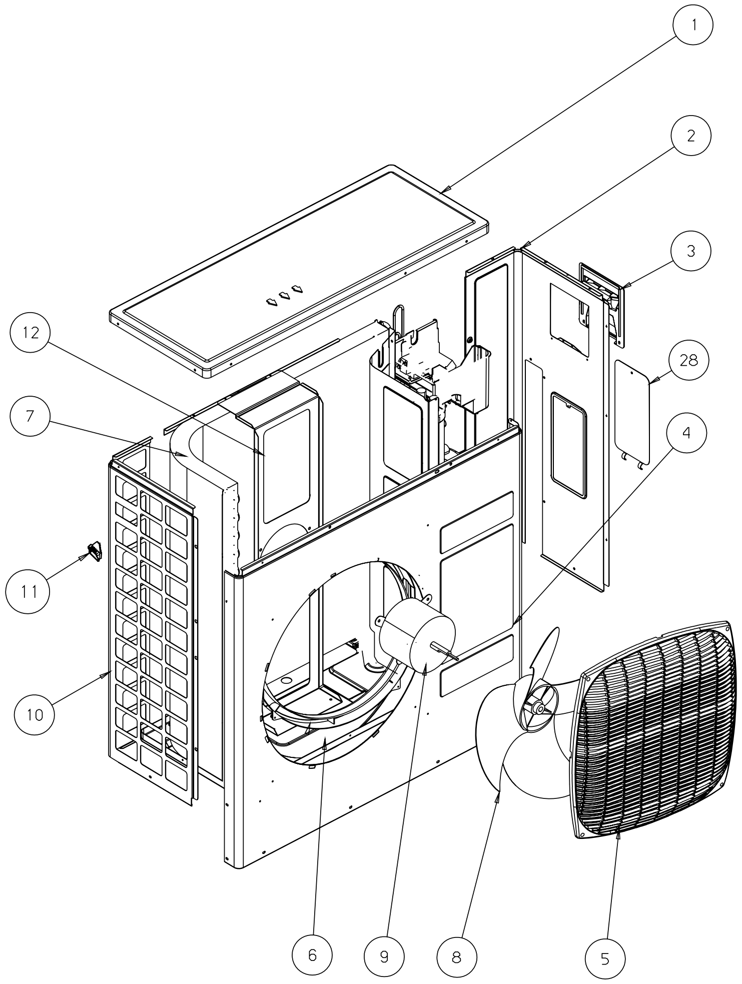


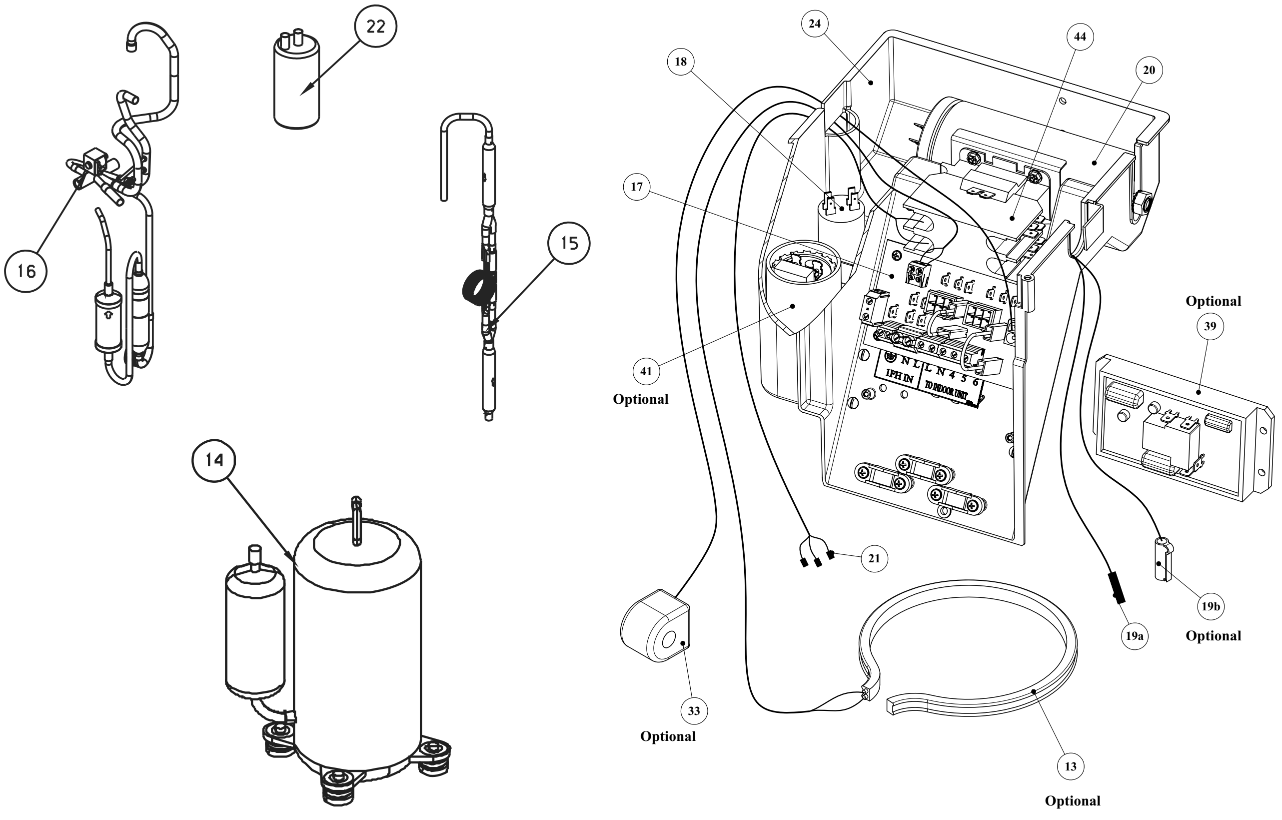
CONTENTS

14.14 Outdoor Unit: GCN 24T

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	433280	SIDE PANEL OU7-24 R410A	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	439329	FRONT COVER/CO' OU7-35/90 EL13	1
5	437091	OU SQUARE FAN GUARD	1
6	433705	NEW BASE ASSY OU 2005 LOCAL R410A	1
7	433846	COIL OU7-24 ST	1
8	4529604	AXIAL FAN D493*143	1
9	434211	MOTOR 70W,2S,OU7/8	1
10	433281	SIDE GUARD OU7-24 R410	1
11	436358	OU LEADING HANDLE	1
12	439342	MOTOR SUPPORT OU7	1
13	190443	HEATER CRANKCASE MITSUBISHI CO	1
14	433753	COMPRESSOR NN27YDAMT	1
15	433845	CAPILLARY ASSY OU7-24 ST R410A	1
16	433817	TUBING ASSY OU7 ST R410A	1
17	438888	BOARD TPHN 3E 9A (RoHS)	1
18	442007	CAPACITOR 6mf 450V P1/P2	1
19a	434716	THERMISTOR+CAP WTH CONNECTOR	1
21	437280	COMPRESSOR WIRING OU10-3PH MIT	1
22	402283	SUCTION ACCUMULATOR 3"x5/8"	1
24	437229	ELECTRICAL BOX TPHN	1
44	433816	SUCTION ASSY OU7 R410A	1
45	433847	GAS VALVE ASSY OU7 ST R410A	1

14.15 Outdoor Unit: GCN 30NRC



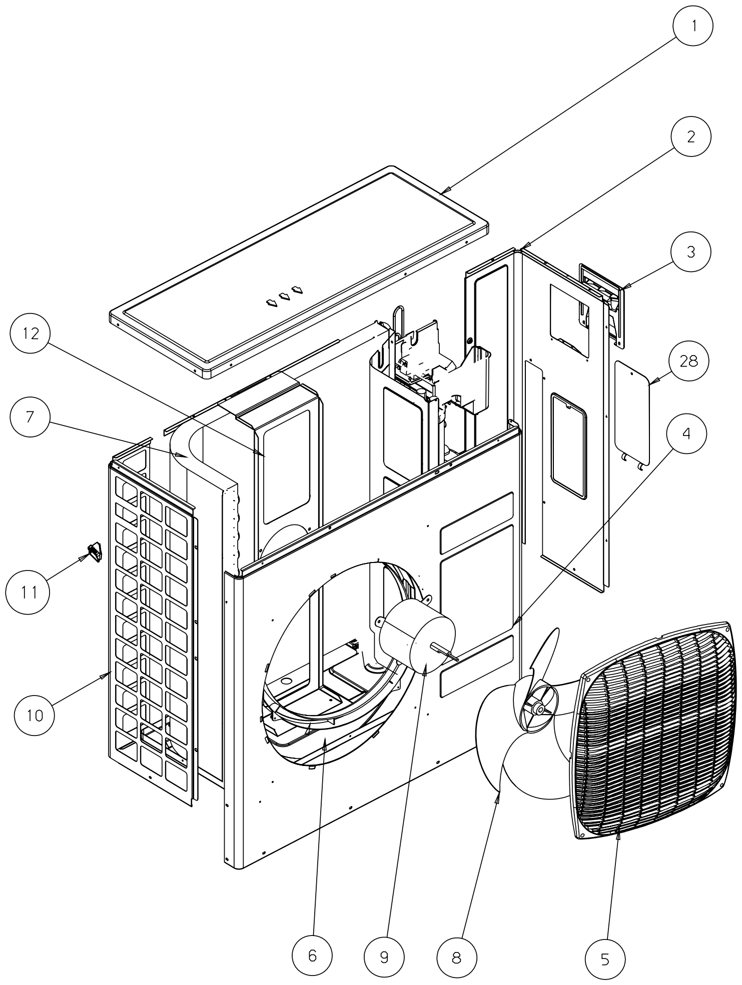


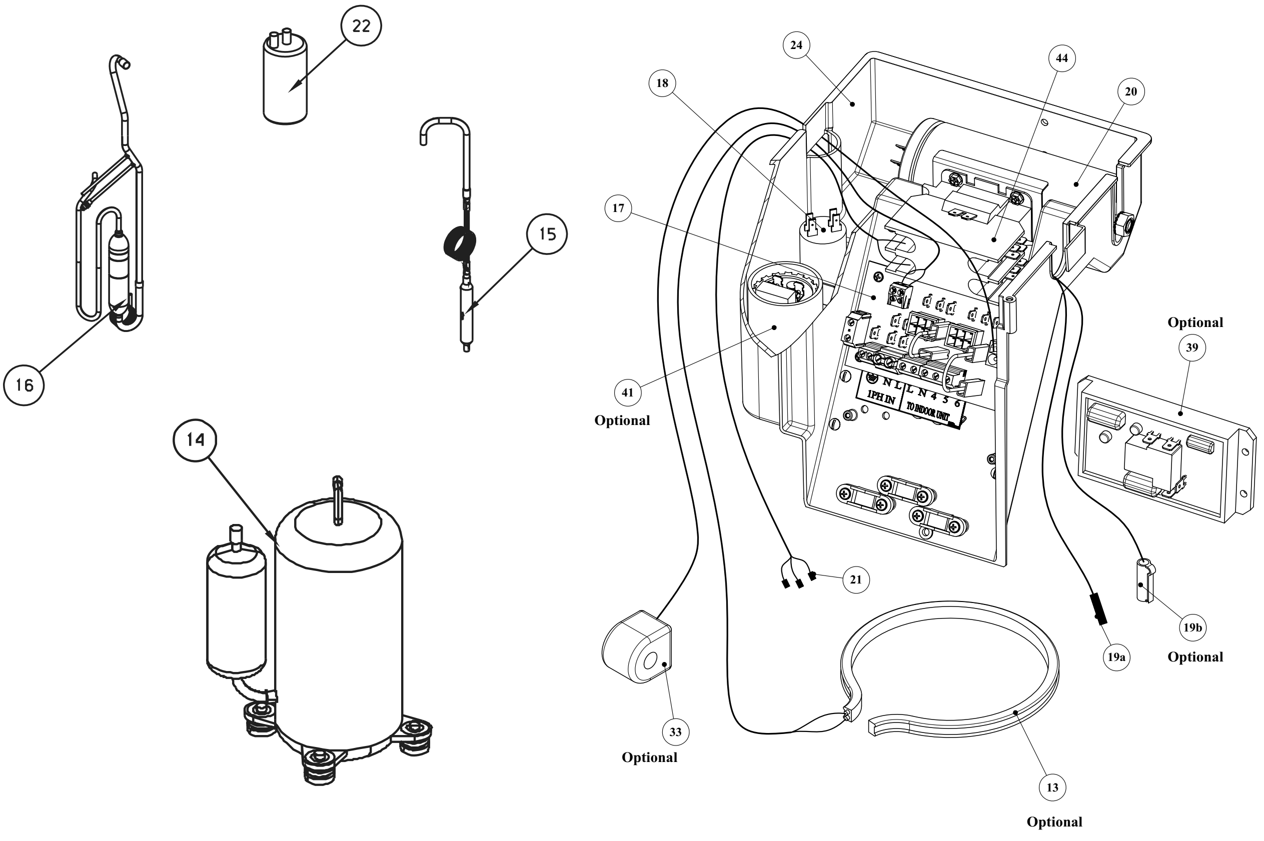
CONTENTS

14.16 Outdoor Unit: GCN 30NRC

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	402930	SIDE PANEL OU8-33	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	402928	FRONT PANEL/COLLECTOR OU8-33 E	1
5	437091	OU SQUARE FAN GUARD	1
6	433722	BASE ASSY OU7-24C EXPORT R410A	1
7	442709	COIL OU8-30 R410 NEW EXPORT	1
8	4529604	AXIAL FAN D493*143	1
9	434211	MOTOR 70W,2S,OU7/8	1
10	403996	SIDE GUARD OU8-33Z	1
11	436358	OU LEADING HANDLE	1
12	439775	MOTOR SUPPORT OU8	1
14	438829	COMPRESSOR GPT330PAB	1
15	433822	CAPILLARY ASSY OU8-30 R410A RC	1
16	442706	TUBING ASSY OU8-30 NEW EXPORT	1
17	413496	BOARD TPHN 5F (RoHS)	1
18	442007	CAPACITOR 6mf 450V P1/P2	1
19a	434716	THERMISTOR+CAP WTH CONNECTOR L	1
20	442010	CAPACITOR 60mF 400V P1/P2	1
21	438850	COMPRESSOR WIRING TPHN-5F OU10	1
22	440002	SUCTION ACCUMULATOR 5" x 5/8"	1
24	437229	ELECTRICAL BOX TPHN	1
28	439656	SIDE COVER OU-8/10	1
33	442466	VALVE COIL L700 MOLEX-SANHUA	1
39		BIG SOFT STARTER (RoHS)	1
41	442022	CAPACITOR SOFT STARTER 161-193	1
44	192207	CONTACTOR 230V, 40A	1

14.17 Outdoor Unit: GCN 30N

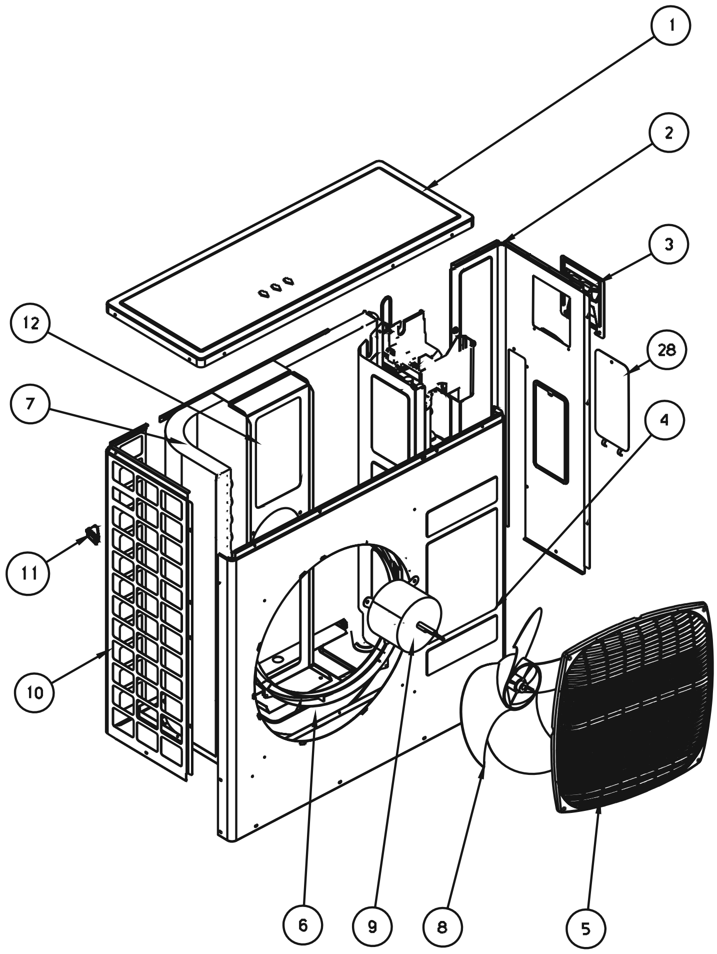


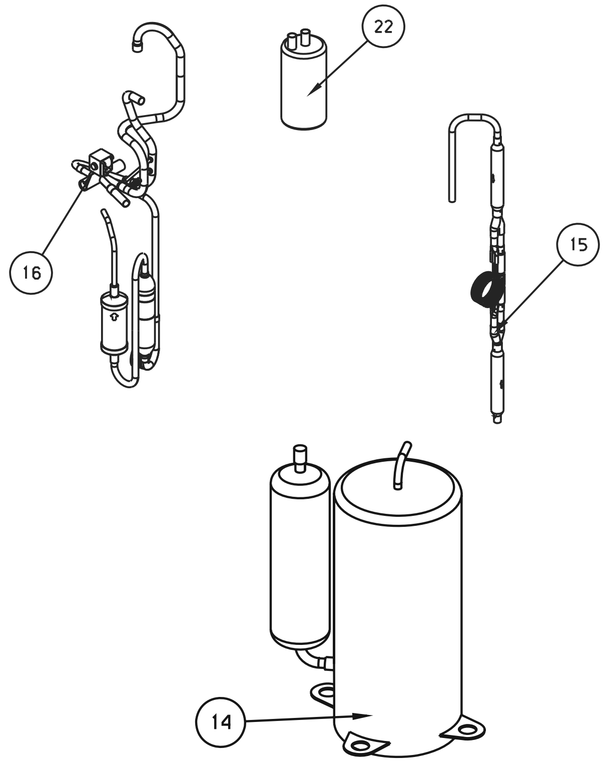


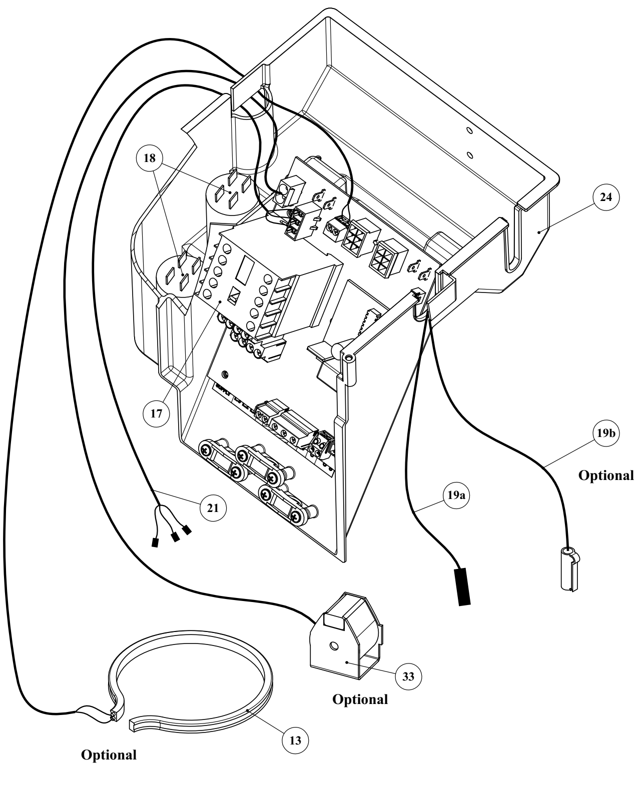
14.18 Outdoor Unit: GCN 30N

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	402930	SIDE PANEL OU8-33	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	402928	FRONT PANEL/COLLECTOR OU8-33 E	1
5	437091	OU SQUARE FAN GUARD	1
6	433705	NEW BASE ASSY OU 2005 LOCAL R4	1
7	433834	COIL OU8-30 ST GR R410A	1
8	4529604	AXIAL FAN D493*143	1
9	434211	MOTOR 70W,2S,OU7/8	1
10	403996	SIDE GUARD OU8-33Z	1
11	436358	OU LEADING HANDLE	1
12	439775	MOTOR SUPPORT OU8	1
13	190443	HEATER CRANKCASE MITSUBISHI CO	1
14	433297	COMPRESSOR NN33VAAMT	1
15	433830	CAPILLARY ASSY OU8-30 R410A ST	1
16	433833	TUBING ASSY OU8-30 ST R410A	1
17	413496	BOARD TPHN 5F (RoHS)	1
18	442007	CAPACITOR 6mf 450V P1/P2	1
19a	434716	THERMISTOR+CAP WTH CONNECTOR L	1
20	442016	CAPACITOR 55mF 450V P1/P2	1
21	438850	COMPRESSOR WIRING TPHN-5F OU10	1
22	402284	SUCTION ACCUMULATOR 5" x 3/4"	1
24	437229	ELECTRICAL BOX TPHN	1
28	439656	SIDE COVER OU-8/10	1
39	467520000R	BIG SOFT STARTER (RoHS)	1
41	442022	CAPACITOR SOFT STARTER 161-193	1
44	192207	CONTACTOR 230V, 40A	1

14.19 Outdoor Unit: GCN 30NRCT





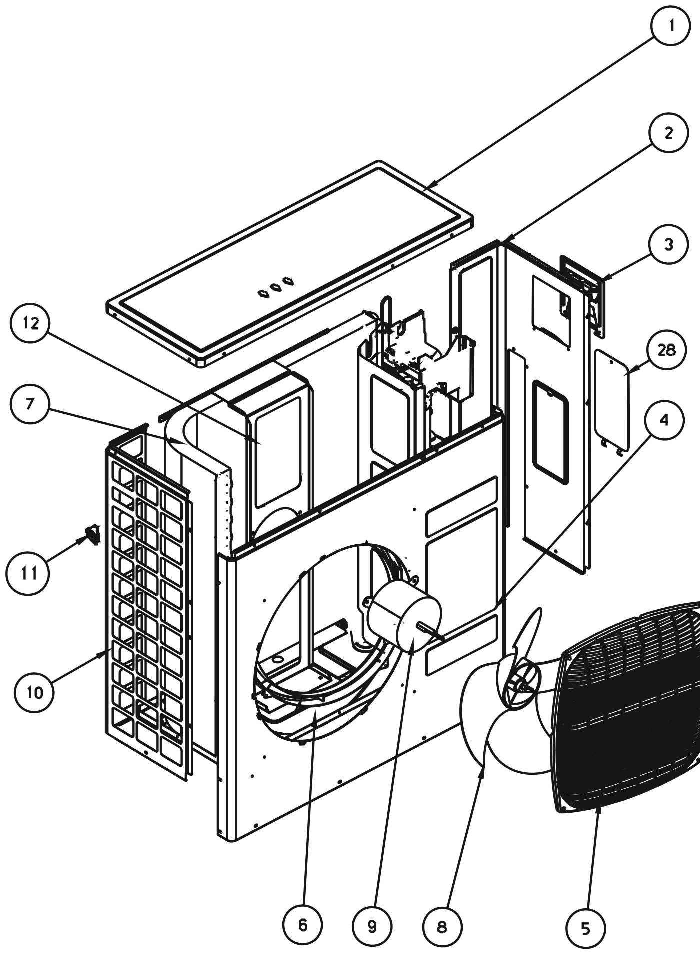


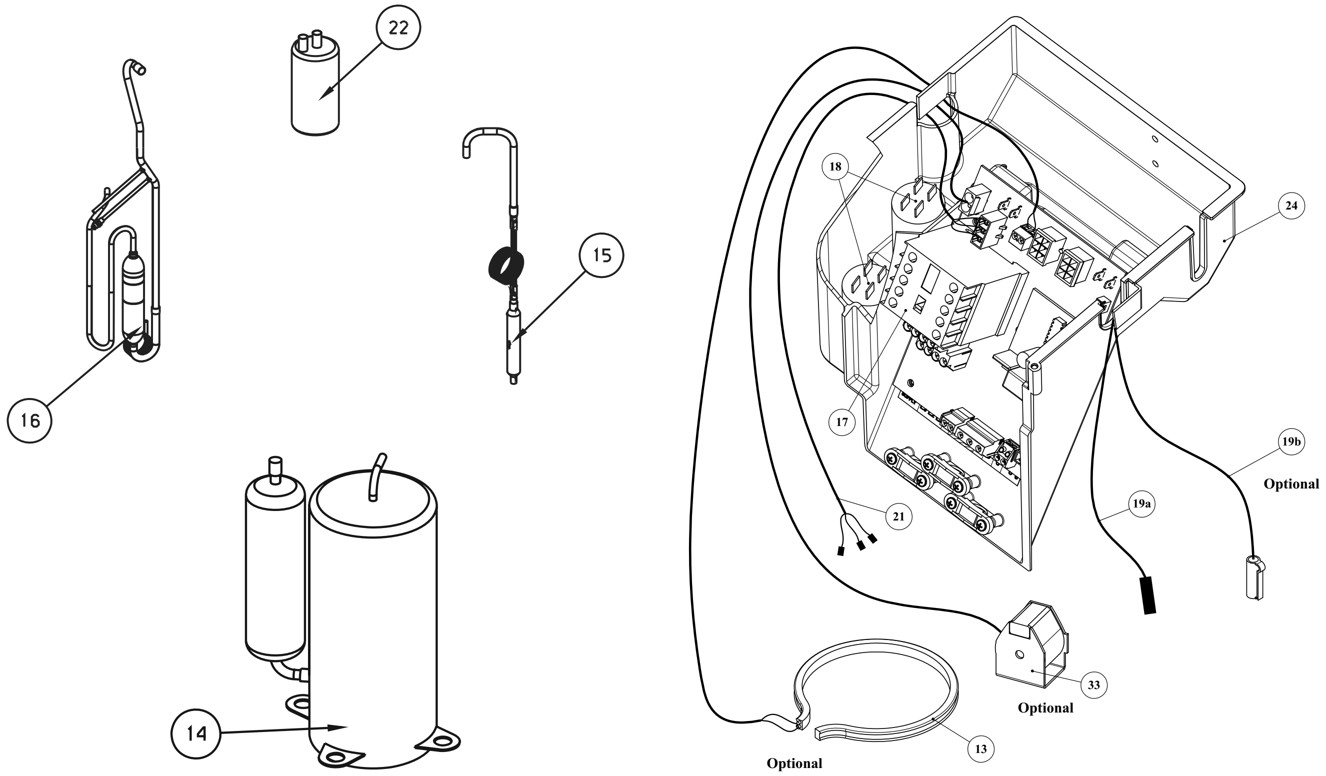
CONTENTS

14.20 Outdoor Unit: GCN 30NRCT

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	402930	SIDE PANEL OU8-33	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	402928	FRONT PANEL/COLLECTOR OU8-33 E	1
5	437091	OU SQUARE FAN GUARD	1
6	433294	NEW BASE ASSY OU 2005 EXPORT R	1
7	433807	COIL OU8-30 GR HDR R410A	1
8	4529604	AXIAL FAN D493*143	1
9	434211	MOTOR 70W,2S,OU7/8	1
10	403996	SIDE GUARD OU8-33Z	1
11	436358	OU LEADING HANDLE	1
12	439775	MOTOR SUPPORT OU8	1
13	190443	HEATER CRANKCASE MITSUBISHI CO	1
14	433298	COMPRESSOR NN33YCAMT	1
15	433822	CAPILLARY ASSY OU8-30 R410A RC	1
16	433974	TUBING ASSY OU8-30 R410A	1
17	438888	BOARD TPHN 3E 9A (RoHS)	1
18	442007	CAPACITOR 6mf 450V P1/P2	1
19a	434716	THERMISTOR+CAP WTH CONNECTOR L	1
21	437280	COMPRESSOR WIRING OU10-3PH MIT	1
22	402284	SUCTION ACCUMULATOR 5" x 3/4"	1
24	437229	ELECTRICAL BOX TPHN	1
28	439656	SIDE COVER OU-8/10	1
33	442466	VALVE COIL L700 MOLEX-SANHUA	1

14.21 Outdoor Unit: GCN 30NT

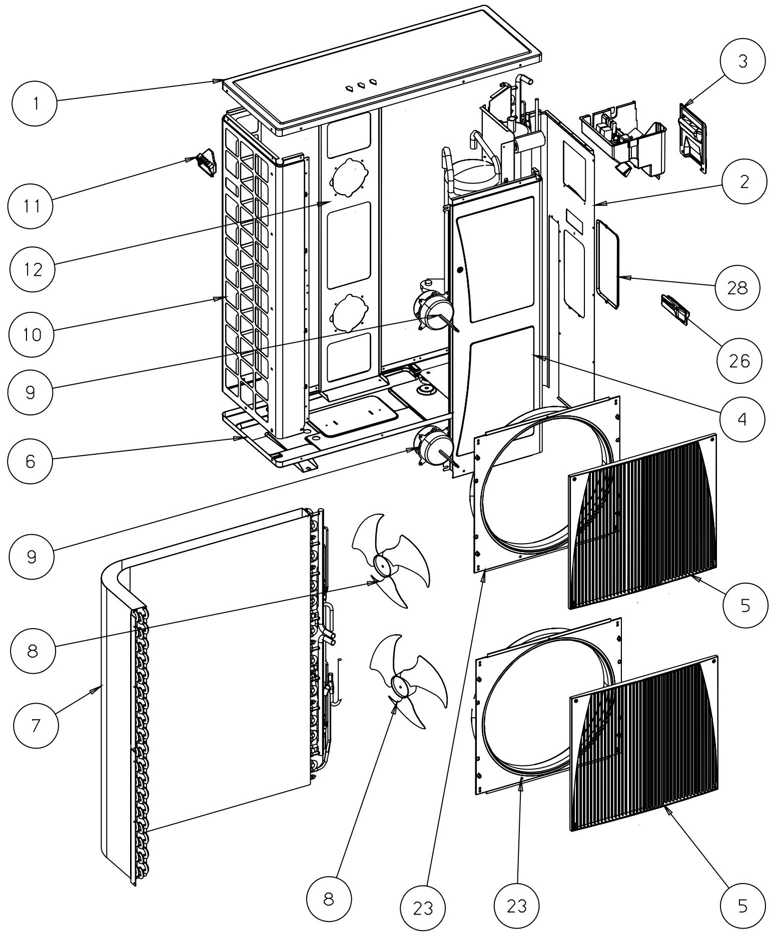


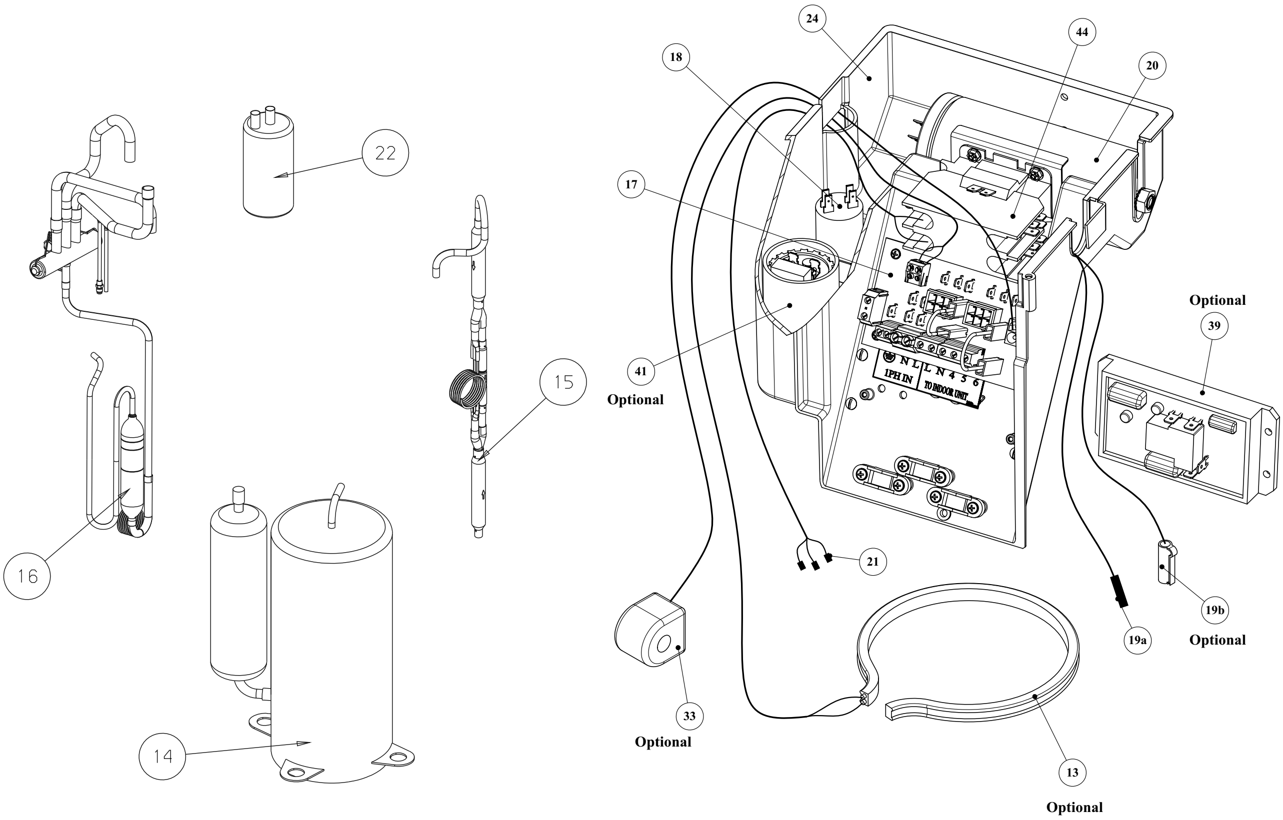


14.22 Outdoor Unit: GCN 30NT

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	402930	SIDE PANEL OU8-33	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	402928	FRONT PANEL/COLLECTOR OU8-33 E	1
5	437091	OU SQUARE FAN GUARD	1
6	433705	NEW BASE ASSY OU 2005 LOCAL R4	1
7	433834	COIL OU8-30 ST GR R410A	1
8	4529604	AXIAL FAN D493*143	1
9	434211	MOTOR 70W,2S,OU7/8	1
10	403996	SIDE GUARD OU8-33Z	1
11	436358	OU LEADING HANDLE	1
12	439775	MOTOR SUPPORT OU8	1
13	190443	HEATER CRANKCASE MITSUBISHI CO	1
14	433298	COMPRESSOR NN33YCAMT	1
15	433830	CAPILLARY ASSY OU8-30 R410A ST	1
16	433833	TUBING ASSY OU8-30 ST R410A	1
17	438888	BOARD TPHN 3E 9A (RoHS)	1
18	442007	CAPACITOR 6mf 450V P1/P2	1
19a	434716	THERMISTOR+CAP WTH CONNECTOR L	1
21	437280	COMPRESSOR WIRING OU10-3PH MIT	1
22	402284	SUCTION ACCUMULATOR 5" x 3/4"	1
24	437229	ELECTRICAL BOX TPHN	1
28	439656	SIDE COVER OU-8/10	1

14.23 Outdoor Unit: GCN 37NRC

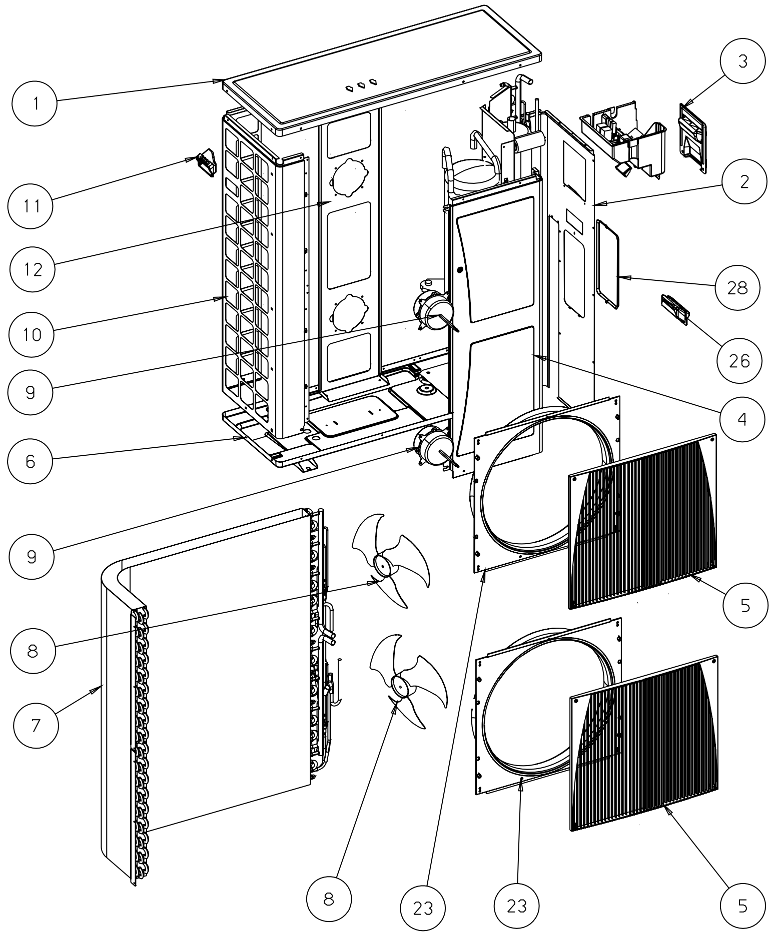


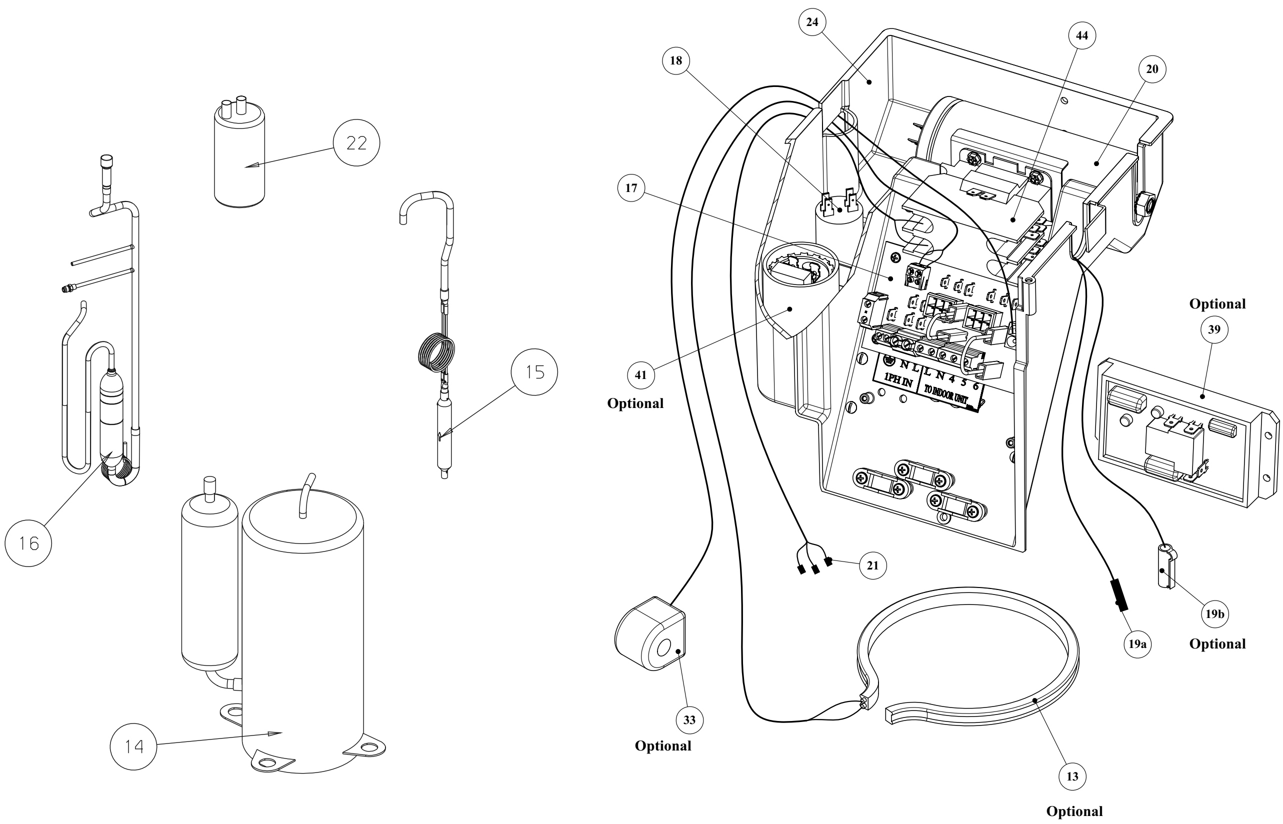


14.24 Outdoor Unit: GCN 37NRC

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	417221	Side panel N OU10	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	456714	FRONT PANEL OU10	1
5	439662	GRILLE OU10	2
6	433294	NEW BASE ASSY OU 2005 EXPORT R	1
7	456786	COIL OU10-36 2r GR HDR R410A	1
8	439650	AXIAL FAN D400*112	2
9	439865	MOTOR 70W,3S,OU10-38	2
10	417223	Side net panel N OU10	1
11	436358	OU LEADING HANDLE	1
12	439657	MOTOR SUPPORT OU10	1
12b	414226	Motor support flange OU-10	1
12c	414229	Motor support clamp bracket OU	1
13	190443	HEATER CRANKCASE MITSUBISHI CO	1
14	433279	COMPRESSOR NN40VAAMT	1
15	433857	CAPILLARY ASSY OU10-36 R410A R	1
16	433967	TUBING ASSY OU10-36 WITH MAFLE	1
17	413496	BOARD TPHN 5F (RoHS)	1
18	442017	CAPACITOR 3mF 450V P1/P2	2
19a	434716	THERMISTOR+CAP WTH CONNECTOR L	1
20	442010	CAPACITOR 60mF 400V P1/P2	1
21	438627	COMPRESSOR WIRING TPHN-5F	1
22	402284	SUCTION ACCUMULATOR 5" x 3/4"	1
23	439661	AIR OUTLET RING OU10	2
24	437229	ELECTRICAL BOX TPHN	1
26	436352	RAISING HANDLE OU10	1
28	439656	SIDE COVER OU-8/10	1
33	442466	VALVE COIL L700 MOLEX-SANHUA	1
44	192207	CONTACTOR 230V, 40A	1

14.25 Outdoor Unit: GCN 37N

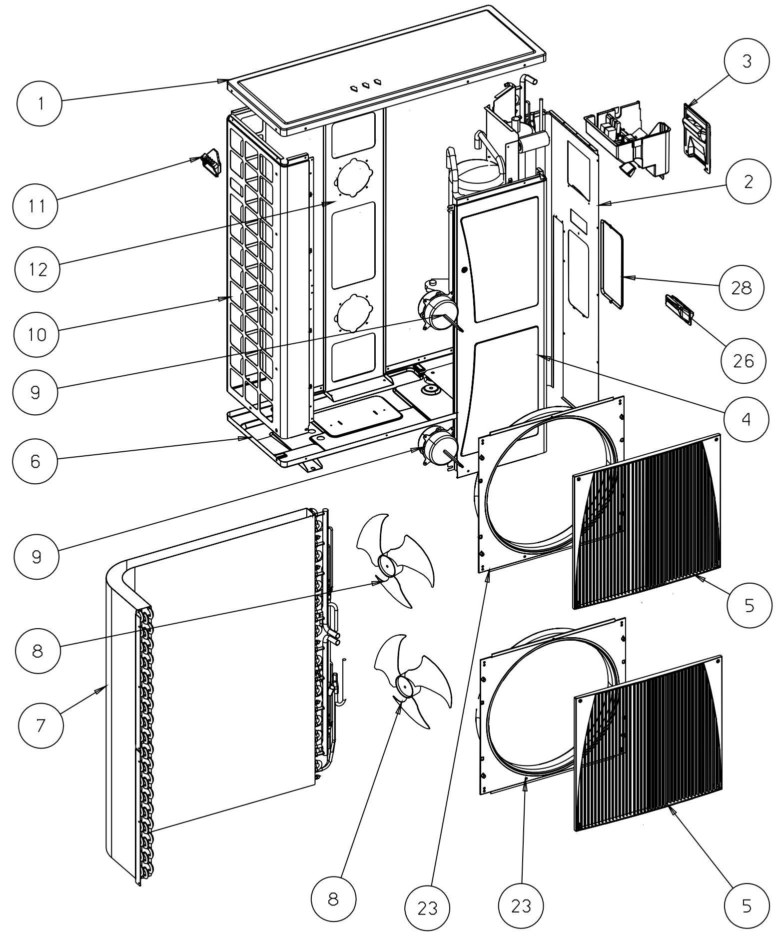


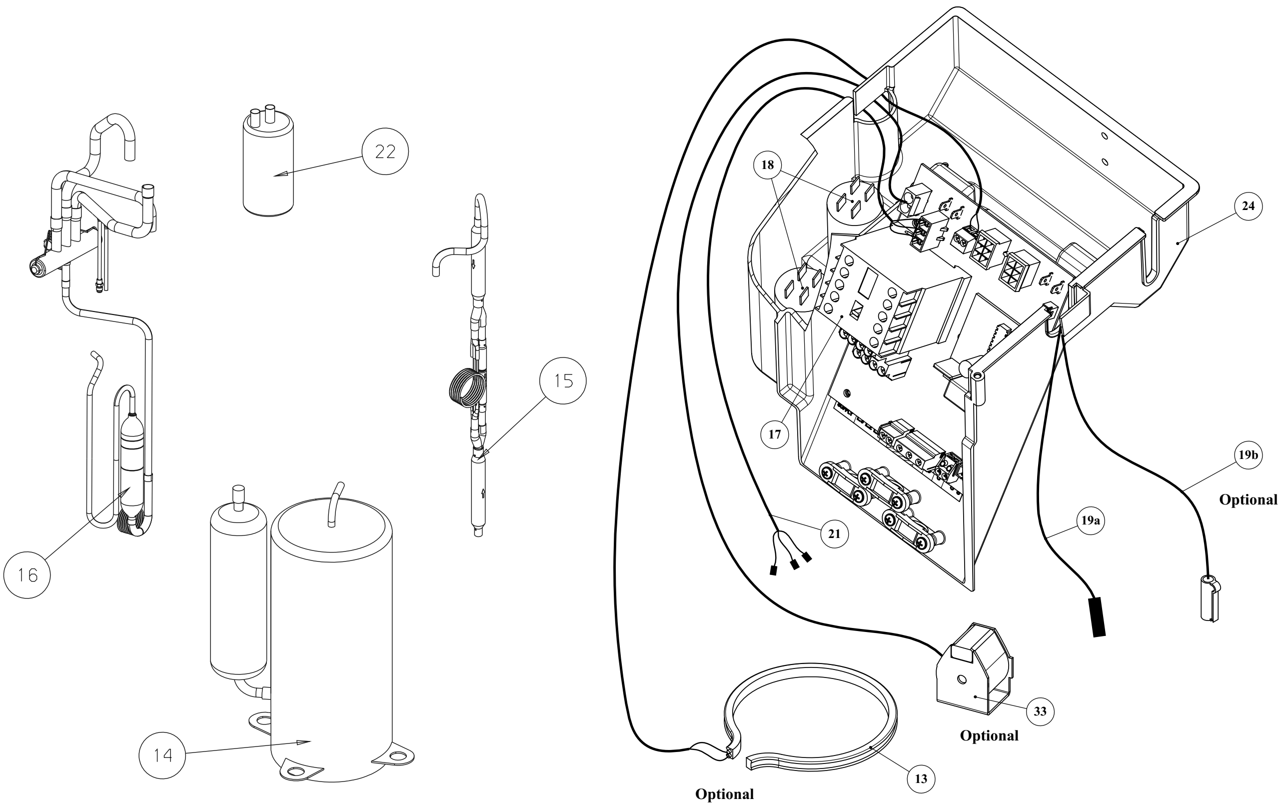


14.26 Outdoor Unit: GCN 37N

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	417221	Side panel N OU10	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	456714	FRONT PANEL OU10	1
5	439662	GRILLE OU10	2
6	433705	NEW BASE ASSY OU 2005 LOCAL R4	1
7	456785	COIL OU10-36 2r ST GR R410A	1
8	439650	AXIAL FAN D400*112	2
9	439865	MOTOR 70W,3S,OU10-38	2
10	417223	Side net panel N OU10	1
11	436358	OU LEADING HANDLE	1
12	439657	MOTOR SUPPORT OU10	1
12b	414226	Motor support flange OU-10	1
12c	414229	Motor support clamp bracket OU	1
13	190443	HEATER CRANKCASE MITSUBISHI CO	1
14	433279	COMPRESSOR NN40VAAMT	1
15	433872	CAPILLARY ASSY OU10-36 ST R410	1
16	433873	TUBING ASSY OU10-36 ST R410A	1
17	413496	BOARD TPHN 5F (RoHS)	1
18	442017	CAPACITOR 3mF 450V P1/P2	2
19a	434716	THERMISTOR+CAP WTH CONNECTOR L	1
20	442010	CAPACITOR 60mF 400V P1/P2	1
21	438627	COMPRESSOR WIRING TPHN-5F	1
22	402284	SUCTION ACCUMULATOR 5" x 3/4"	1
23	439661	AIR OUTLET RING OU10	2
24	437229	ELECTRICAL BOX TPHN	1
26	436352	RAISING HANDLE OU10	1
28	439656	SIDE COVER OU-8/10	1
44	192207	CONTACTOR 230V, 40A	1

14.27 Outdoor Unit: GCN 37NRCT

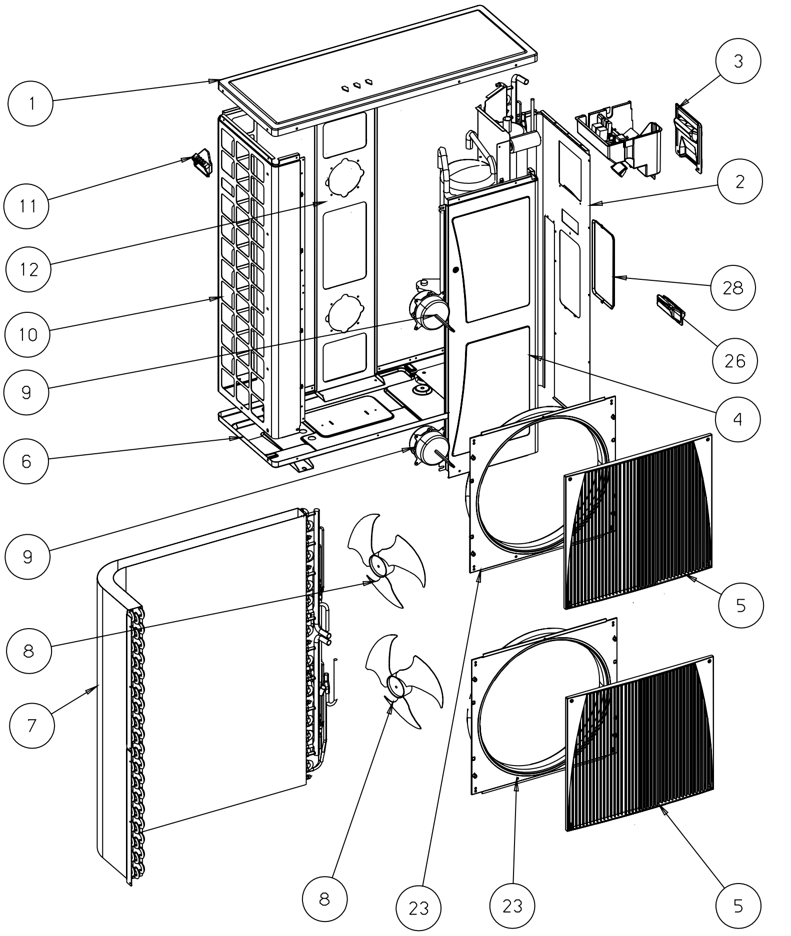


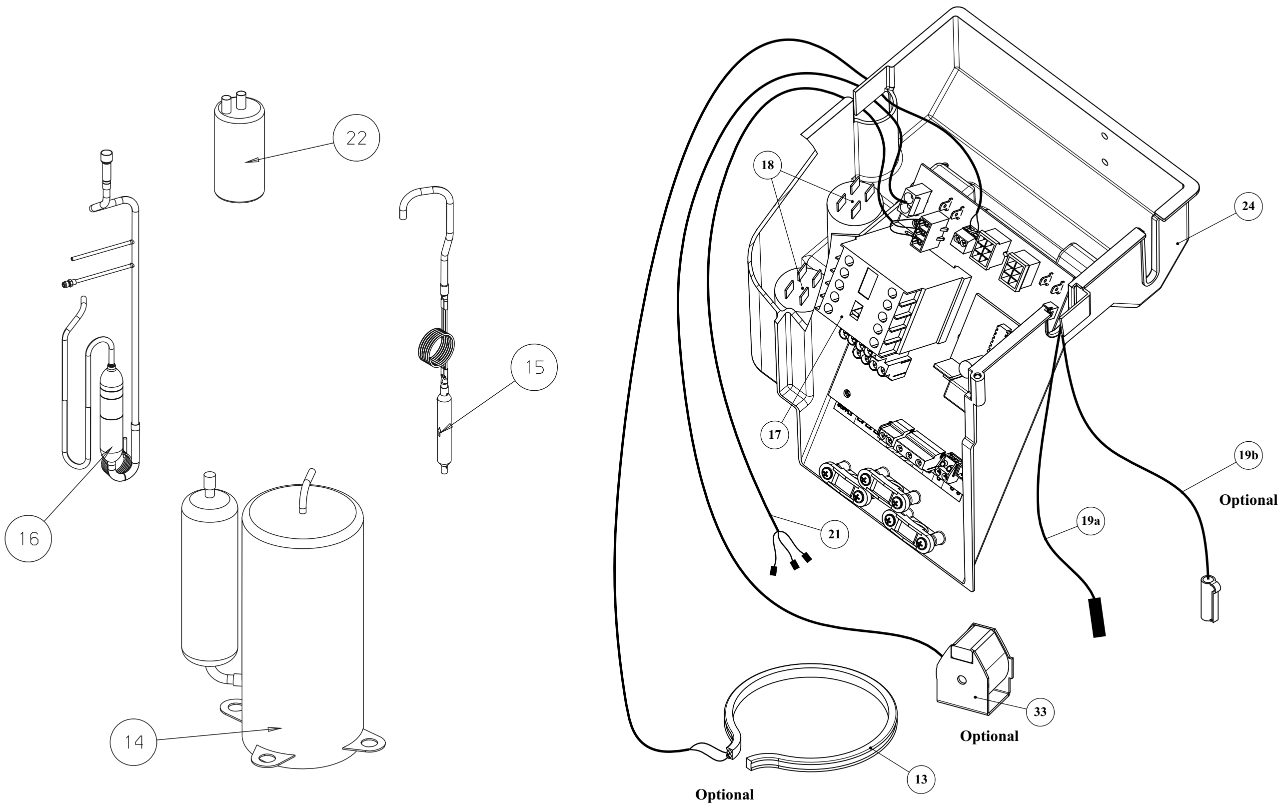


14.28 Outdoor Unit: GCN 37NRCT

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	417221	Side panel N OU10	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	456714	FRONT PANEL OU10	1
5	439662	GRILLE OU10	2
6	433294	NEW BASE ASSY OU 2005 EXPORT R	1
7	456786	COIL OU10-36 2r GR HDR R410A	1
8	439650	AXIAL FAN D400*112	2
9	439865	MOTOR 70W,3S,OU10-38	2
10	417223	Side net panel N OU10	1
11	436358	OU LEADING HANDLE	1
12	439657	MOTOR SUPPORT OU10	1
12b	414226	Motor support flange OU-10	1
12c	414229	Motor support clamp bracket OU	1
13	190443	HEATER CRANKCASE MITSUBISHI CO	1
14	433855	COMPRESSOR NN40YCAMT	1
15	433857	CAPILLARY ASSY OU10-36 R410A R	1
16	433967	TUBING ASSY OU10-36 WITH MAFLE	1
17	438888	BOARD TPHN 3E 9A (RoHS)	1
18	442017	CAPACITOR 3mF 450V P1/P2	2
19a	434716	THERMISTOR+CAP WTH CONNECTOR L	1
21	437280	COMPRESSOR WIRING OU10-3PH MIT	1
22	402284	SUCTION ACCUMULATOR 5" x 3/4"	1
23	439661	AIR OUTLET RING OU10	2
24	437229	ELECTRICAL BOX TPHN	1
26	436352	RAISING HANDLE OU10	1
28	439656	SIDE COVER OU-8/10	1
33	442466	VALVE COIL L700 MOLEX-SANHUA	1

14.29 Outdoor Unit: GCN 37NT

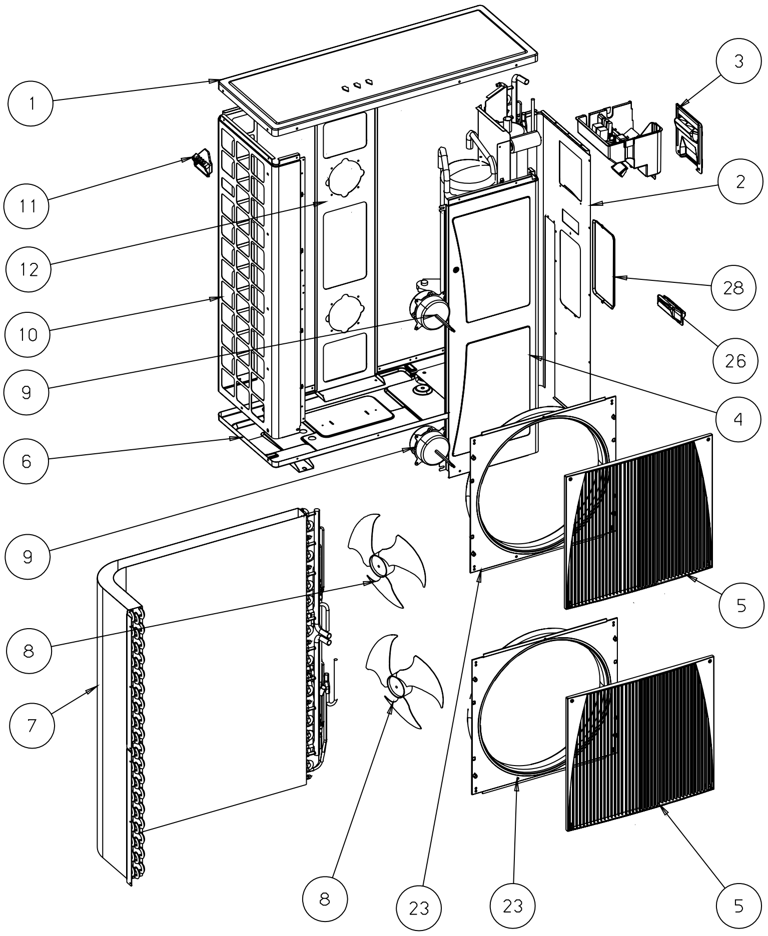


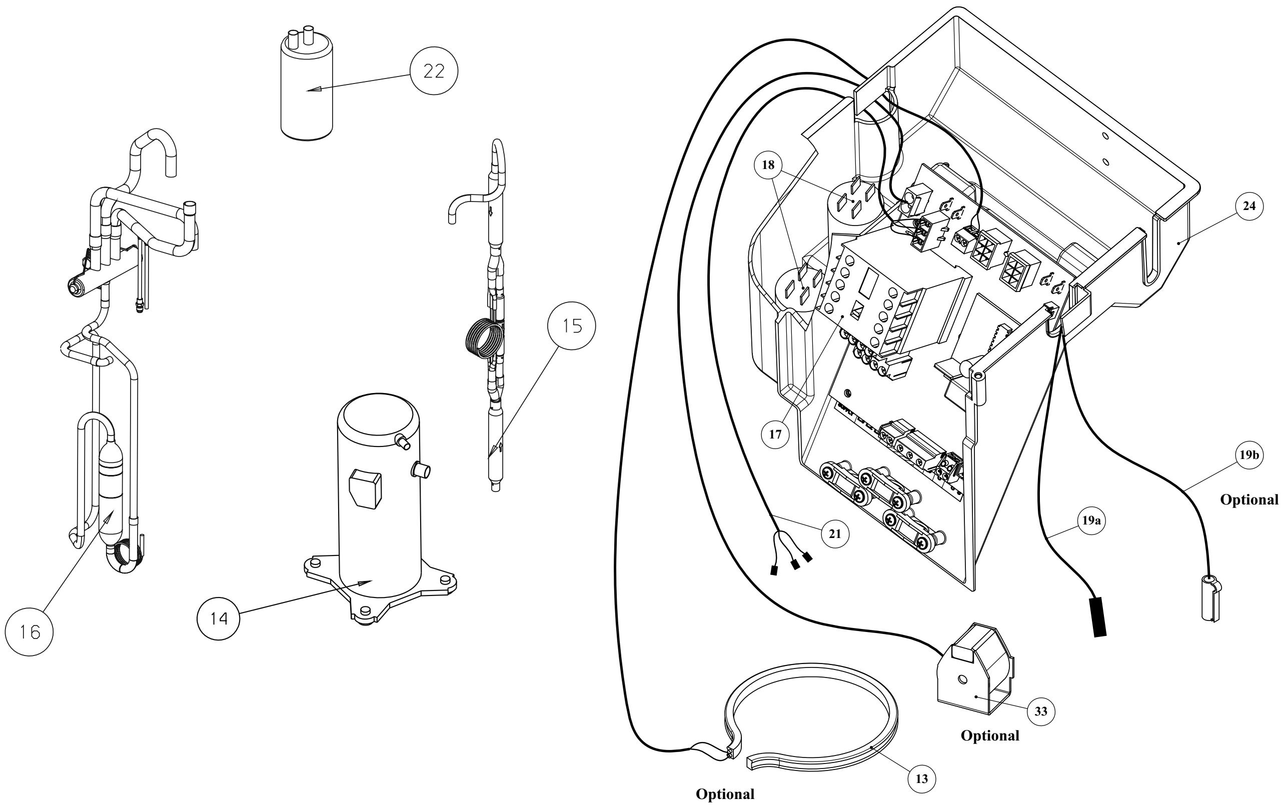


14.30 Outdoor Unit: GCN 37NT

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	417221	Side panel N OU10	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	456714	FRONT PANEL OU10	1
5	439662	GRILLE OU10	2
6	433705	NEW BASE ASSY OU 2005 LOCAL R4	1
7	456785	COIL OU10-36 2r ST GR R410A	1
8	439650	AXIAL FAN D400*112	2
9	439865	MOTOR 70W,3S,OU10-38	2
10	417223	Side net panel N OU10	1
11	436358	OU LEADING HANDLE	1
12	439657	MOTOR SUPPORT OU10	1
12b	414226	Motor support flange OU-10	1
12c	414229	Motor support clamp bracket OU	1
13	190443	HEATER CRANKCASE MITSUBISHI CO	1
14	433855	COMPRESSOR NN40YCAMT	1
15	433872	CAPILLARY ASSY OU10-36 ST R410	1
16	433873	TUBING ASSY OU10-36 ST R410A	1
17	438888	BOARD TPHN 3E 9A (RoHS)	1
18	442017	CAPACITOR 3mF 450V P1/P2	2
19a	434716	THERMISTOR+CAP WTH CONNECTOR L	1
21	437280	COMPRESSOR WIRING OU10-3PH MIT	1
22	402284	SUCTION ACCUMULATOR 5" x 3/4"	1
23	439661	AIR OUTLET RING OU10	2
24	437229	ELECTRICAL BOX TPHN	1
26	436352	RAISING HANDLE OU10	1
28	439656	SIDE COVER OU-8/10	1

14.31 Outdoor Unit: GCN 47NRCT

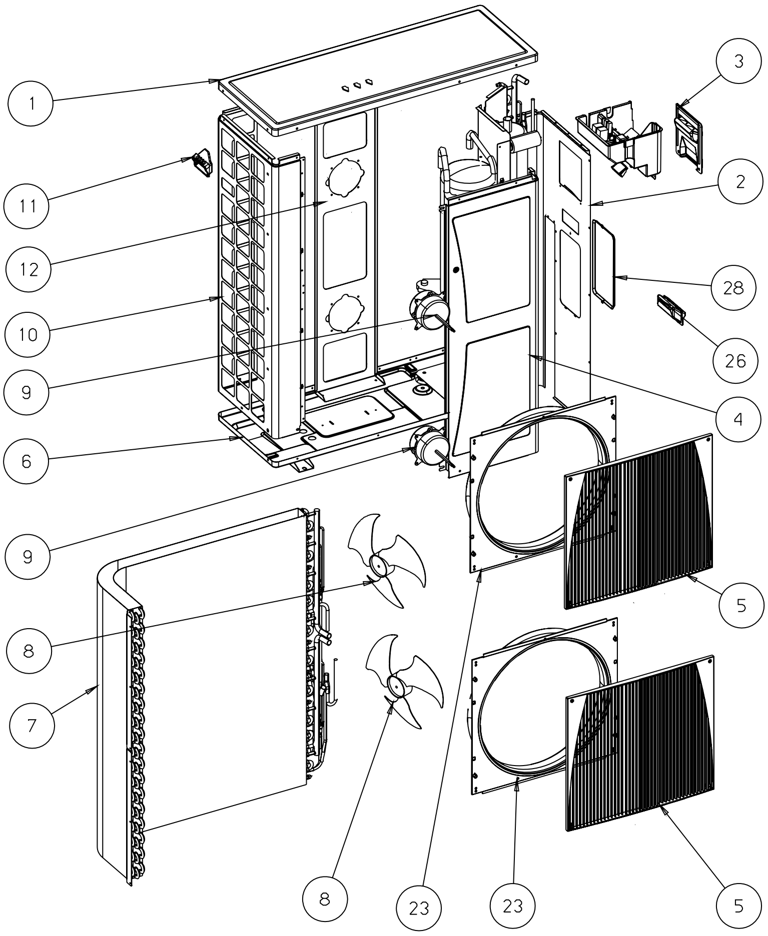


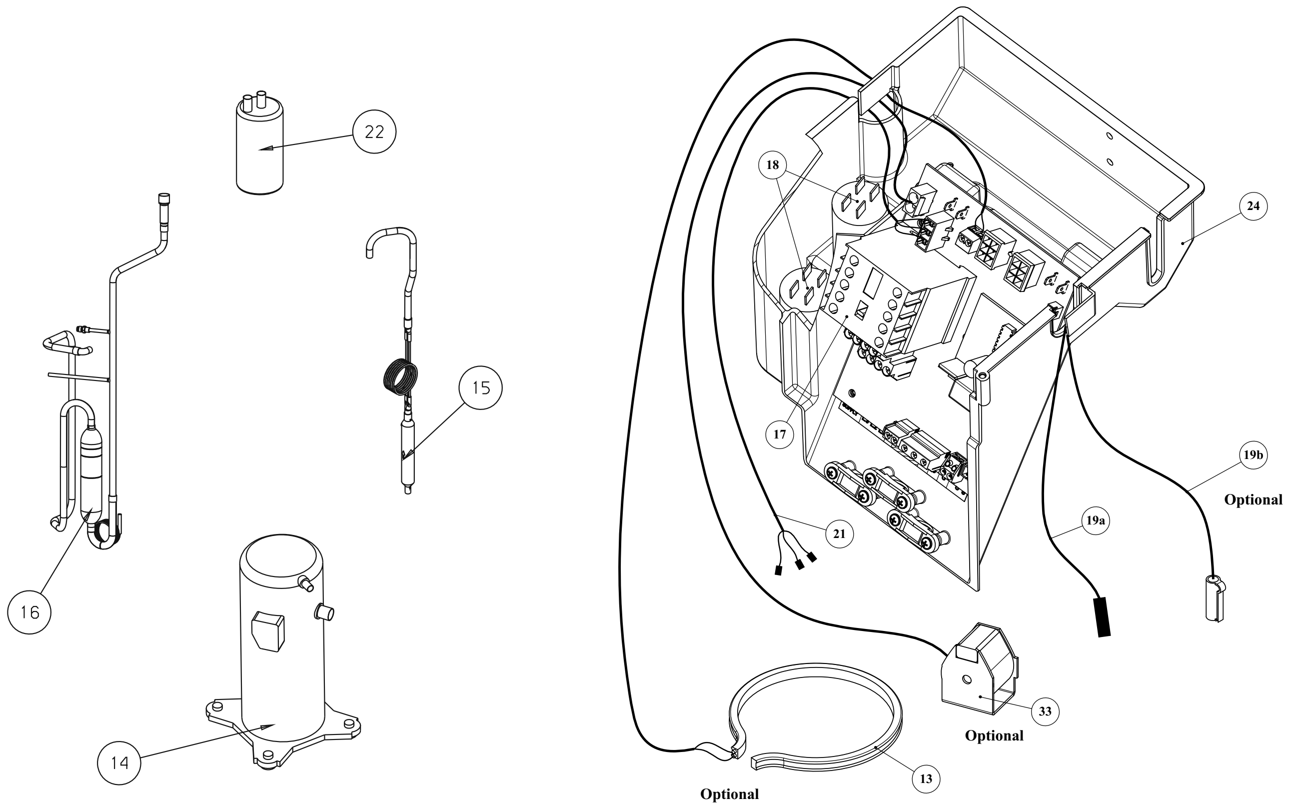


14.32 Outdoor Unit: GCN 47NRCT

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	417221	Side panel N OU10	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	456714	FRONT PANEL OU10	1
5	439662	GRILLE OU10	2
6	439833	NEW BASE ASSY OU EXPORT	1
7	442712	COIL OU10-47 GR HDR 2R NEW R41	1
8	439650	AXIAL FAN D400*112	2
9	439651	MOTOR 70W,3S,OU10-50	2
10	417223	Side net panel N OU10	1
11	436358	OU LEADING HANDLE	1
12	439657	MOTOR SUPPORT OU10	1
12b	414226	Motor support flange OU-10	1
12c	414229	Motor support clamp bracket OU	1
13	190443	HEATER CRANKCASE MITSUBISHI CO	1
14	438824	COMPRESSOR ZP54KSE-TPM	1
15	441107	CAPILLARY ASSY OU10-47Z	1
16	438957	Tubing Assembly OU10-47 EXPORT	1
17	438886	BOARD TPHN 3G 12A (RoHS)	1
18	442017	CAPACITOR 3mF 450V P1/P2	2
19a	434716	THERMISTOR+CAP WTH CONNECTOR L	1
19b	402741	THERMISTOR WTH CONNECTOR L1250	1
21	445320	COMPRESSOR WIRING WITHOUT PLUG	1
22	402284	SUCTION ACCUMULATOR 5" x 3/4"	1
23	439661	AIR OUTLET RING OU10	2
24	437229	ELECTRICAL BOX TPHN	1
26	436352	RAISING HANDLE OU10	1
28	439656	SIDE COVER OU-8/10	1
33	442466	VALVE COIL L700 MOLEX-SANHUA	1

14.33 Outdoor Unit: GCN 47NT





14.34 Outdoor Unit: GCN 47NT

No.	Item	Description	Quantity
1	437045	UPPER COVER EL13 OU LARGE	1
2	417221	Side panel N OU10	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	456714	FRONT PANEL OU10	1
5	439662	GRILLE OU10	2
6	439841	NEW BASE ASSY OU LOCAL	1
7	442712	COIL OU10-47 GR HDR 2R NEW R41	1
8	439650	AXIAL FAN D400*112	2
9	439651	MOTOR 70W,3S,OU10-50	2
10	417223	Side net panel N OU10	1
11	436358	OU LEADING HANDLE	1
12	439657	MOTOR SUPPORT OU10	1
12b	414226	Motor support flange OU-10	1
12c	414229	Motor support clamp bracket OU	1
13	190443	HEATER CRANKCASE MITSUBISHI CO	1
14	438824	COMPRESSOR ZP54KSE-TPM	1
15	442733	CAPILLARY ASSY OU10-47 NEW ST	1
17	438886	BOARD TPHN 3G 12A (RoHS)	1
18	442017	CAPACITOR 3mF 450V P1/P2	2
19a	434716	THERMISTOR+CAP WTH CONNECTOR L	1
21	445320	COMPRESSOR WIRING WITHOUT PLUG	1
22	402284	SUCTION ACCUMULATOR 5" x 3/4"	1
23	439661	AIR OUTLET RING OU10	2
24	437229	ELECTRICAL BOX TPHN	1
26	436352	RAISING HANDLE OU10	1
28	439656	SIDE COVER OU-8/10	1

15. OPTIONAL ACCESSORIES

15.1 RCW Wall Mounted Remote Cntrol

15.1.1 The RCW wall mounted remote control can be fitted to a large range and models, It can be used as IR (wirless mode) or wired controler.the RCW can control up to15 indoor units using the same settings (on its wired aplication),

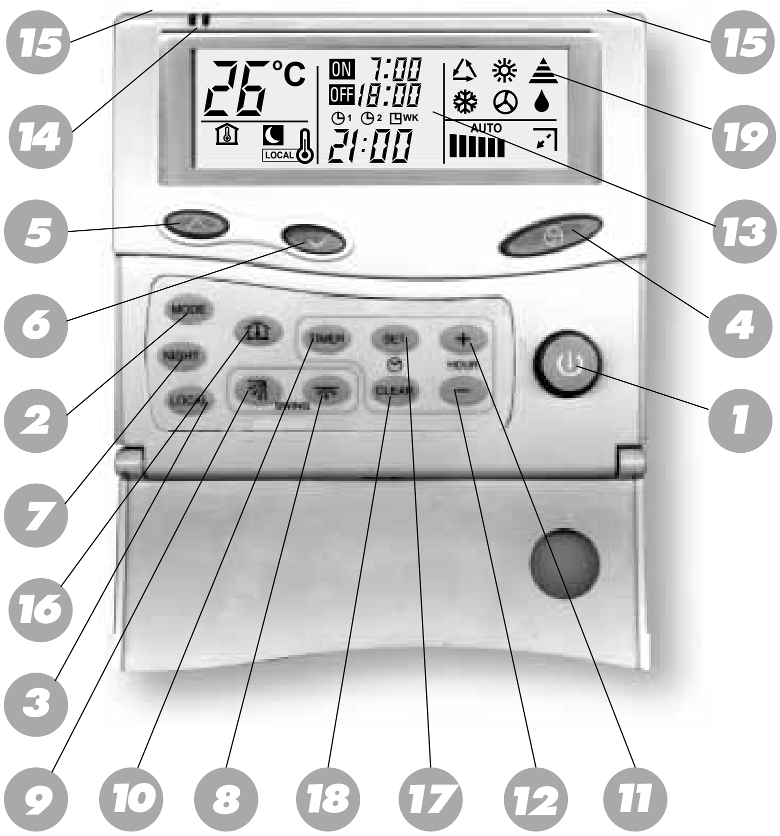
The max wiring length between the controller to the last indoor unit is 300m. for application on WNG LED indoor units an additional interface PCB is needed.

Ordering code no':

RCW – 436195
WNG add' PCB - SP000000290.

REMOTE CONTROL

1. START / STOP button
2. Operation mode selection button COOLING, HEATING, AUTO COOL / HEAT, DRY, FAN.
3. LOCAL temperature sensing button
4. FAN SPEED and AUTO FAN button
5. Room temperature UP button
6. Room temperature DOWN Button
7. NIGHT button
8. Airflow direction MANUAL positioning cor
9. Airflow direction AUTO-CONTROL buttor
10. TIMER button
11. TIMER UP button
12. TIMER DOWN button
13. LCD operation display
14. LOCAL sensor
15. Infrared signal transmitter
16. ROOM temperature button
17. TIMER SET button
18. TIMER CLEAR button
19. Transmission sign



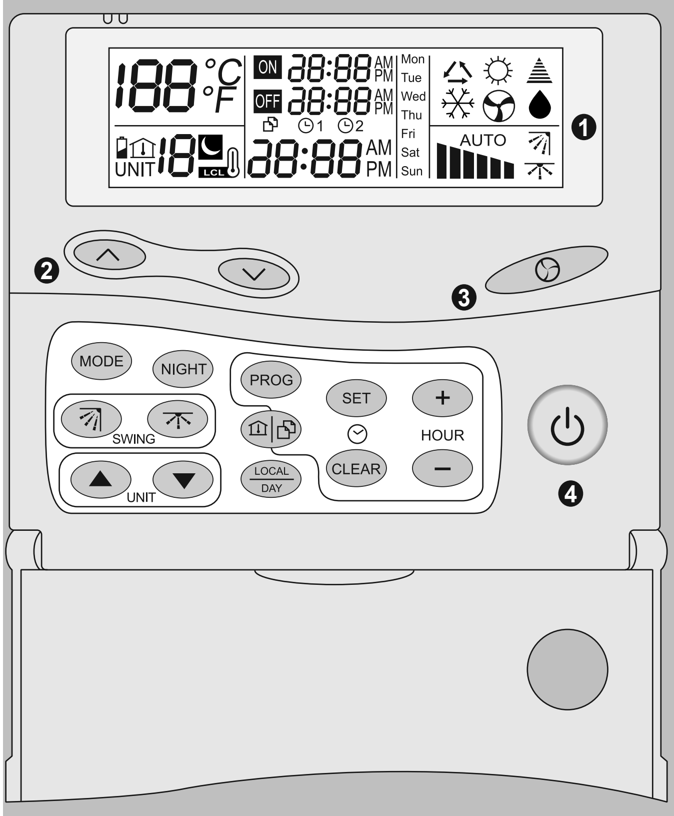
15.2 RCW2 Wall Mounted Remote Cntrol

15.2.1 The RCW2 wall mounted remote controler is a wired controler that can provide affective controling management up to 15 different settings and temp' zones.

The RCW2 can be connected up to a max' of 32 units,allowing a max wiring length of 1000m. for application on WNG LED indoor units an additional interface PCB is needed.

Ordering code no':

RCW2 – SP000000081
WNG add' PCB - SP000000290

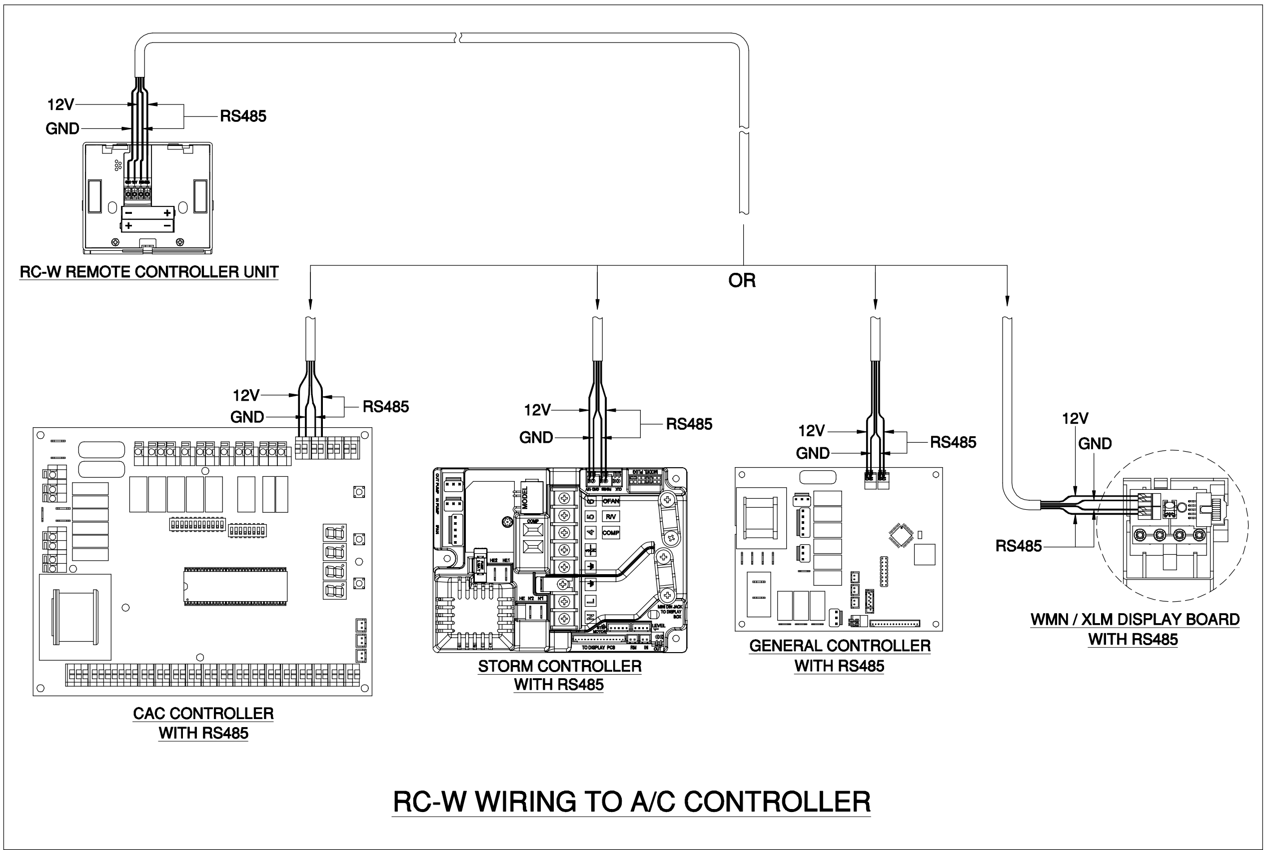


1. Display screen.
2. Keys for raising and lowering the set temperature.
3. Ventilation mode selection :
   - Low speed.
   - Medium speed.
   - High speed.
   - AUTO : Automatic speed selection.
4. ON / Standby.

- SET: Accessing the time setting mode.
- +: Advancing the time setting.
- –: Retarding the time setting.
- CLEAR: Clearing memory of programmed time settings in programming mode.
- LOCAL DAY: Day of the week selection key or sending "I feel" local temperature setting.
- PROG: Programming mode key.
- "Copy" key, enabling zone parameters to be duplicated for other zones.
- MODE: Operating mode selection.
- NIGHT: Day /Night key.
- ▲: Current zone setting: zone above.
- ▼: Current zone setting: zone below.
- Louver : step by step or horizontal.
- Louver : vertical.

CONTENTS

15.3 RCW/RCW2 Wiring Connections as Shown on Kit



All Season Kit Installation Instruction(for ST units only)

Switch off power supply to the unit

Fig.1

- Remove:
  - Cover **A;**
  - Power panel handle **B;**
  - Side cover **C** (if it exist).

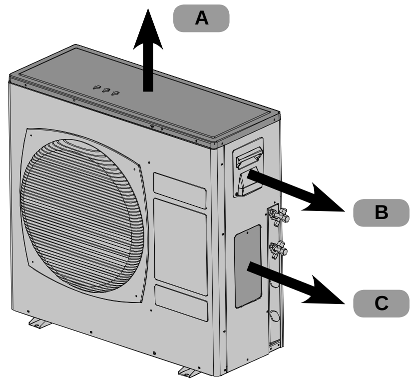


Fig.1

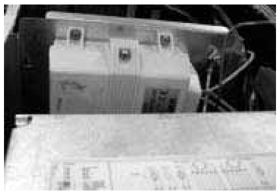
Fig.2

- Mount the Fan speed controller on the partition of the compressor compartment in the holes provided, using four supplied screws .

Note:
- In outdoor models OU8, the Fan Speed Controller should be mounted on the partition toward the outdoor fan motor side.



OU7



OU10



OU8

Fig.2

Fig.3

- Unscrew the cap of the provided service valve **D** and connect to the **T-valve**, supplied in the kit. Use Copper sealing gasked between the flare nut and it's connection to service valve **D**.

Note:
- The **"T-valve"** supplied in the kit is installed between valve **D** and capillary **E** offering the possibility of an additionall pressure connecting output for service.

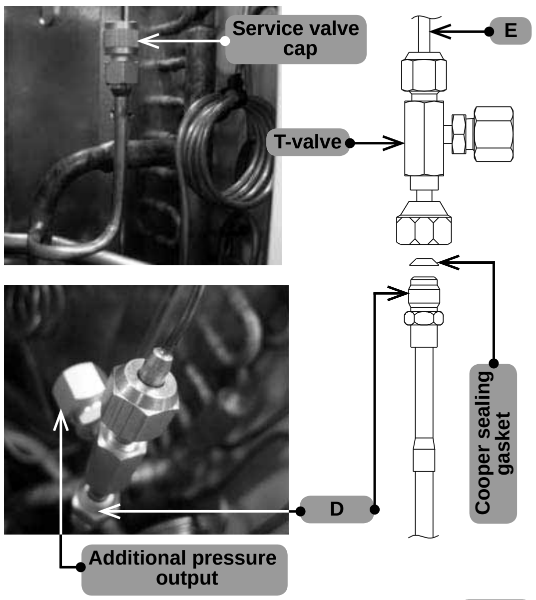
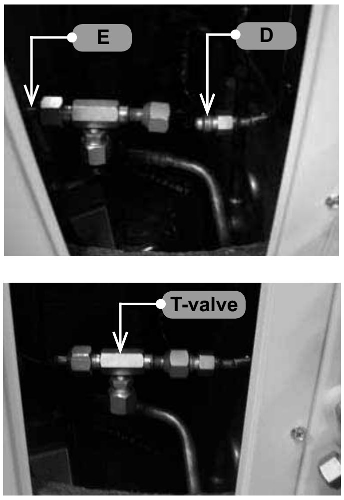


Fig.3

Fig.4

- Connect capillary **E** to **T-valve**.
  Use Copper sealing gasket between the flare nut and the connection to **T-valve.**

Note:
- Installing the Copper sealing gasket is mandatory in order to avoid refrigerant leak.



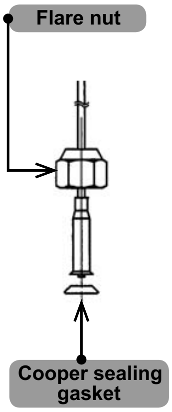


Fig.4

Fig.5

Electrical connections for 1PH units:

- Disconnect the wire from point "6" on main terminal outdoor PCB Typhoon and isolate it with isolation tape.
- Disconnect the JP1 and JP2 wires from tabs TB2; TB4; TB5 on PCB Typhoon.
  Connect the Red Wire from Fan Speed Controller to tab "TB4" on PCB Typhoon.
- Connect Green Wire from Fan Speed Controller to tab "TB2" on PCB Typhoon.
- Connect Y/Green wire from Fan Speed Controller to ground screw on units partition.
- Return "JP1" wire, previously disconnected, to tab "TB2".

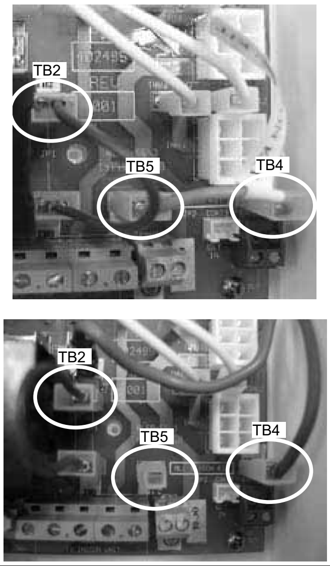


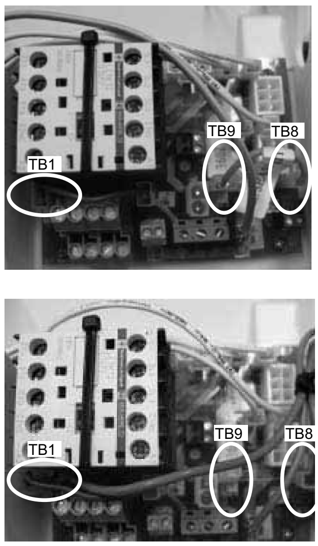


Fig.5

Fig.6

Electrical connections for 3PH units:

- Disconnect the wire from point "6" on main terminal PCB Typhoon and isolate it with isolation tape.
- Disconnect the JP1 and JP2 wires from tabs TB1; TB8; TB9 on PCB Typhoon.
- Connect Red Wire from Fan Speed Controller to tab "TB8" on PCB Typhoon.
- Connect Green Wire from Fan Speed Controller to Tab "TB1" on PCB Typhoon.
- Connect Y/Green wire from Fan Speed Controller to ground screw on units partition.
- Return "JP1" wire, previously disconnected, to



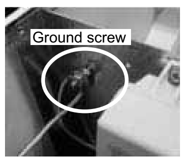
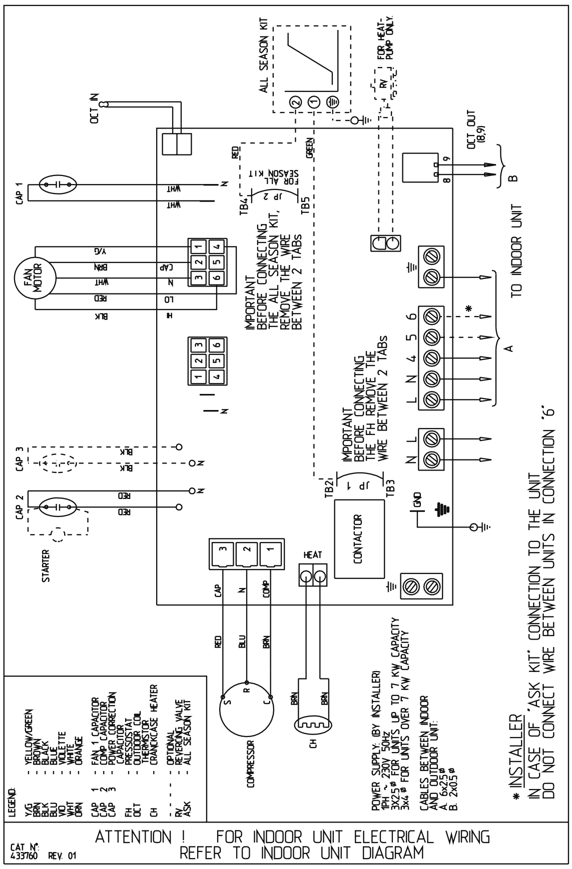


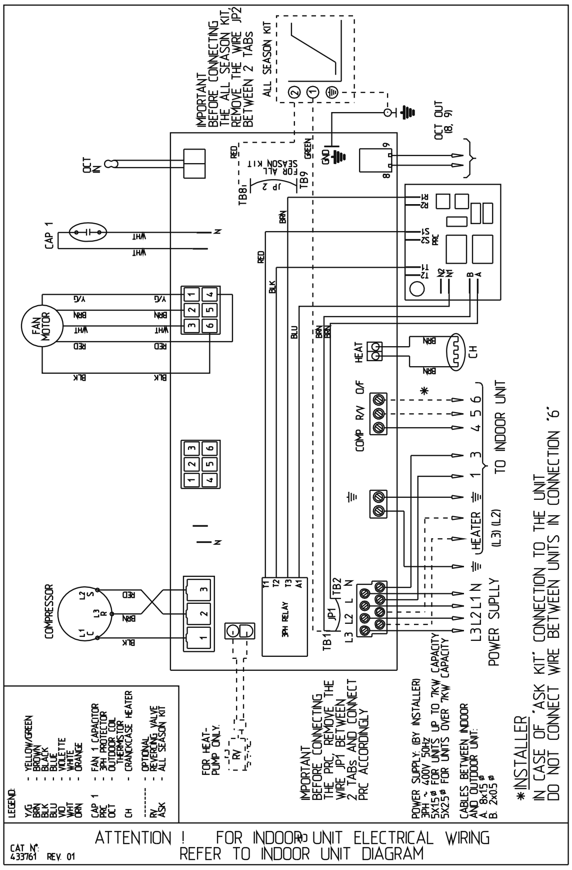
Fig.6

Fig.7

- Verify the wiring to electrical diagram.



1PH Unit



3PH Unit

Fig.8

- Arrange the wires and capillary tube together with plastic ties, don’t fold or break the capillary tube,keep a large loop for extra length of capillary tube.
- Check for refrigerant leaks.

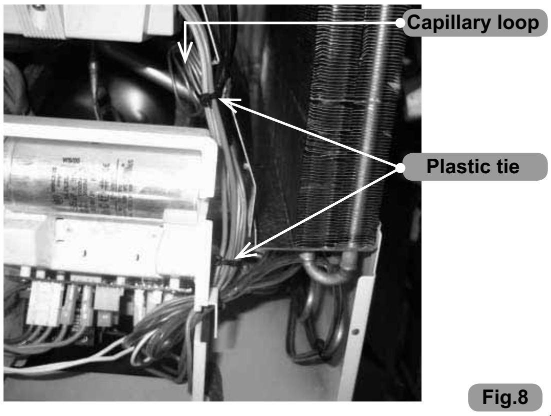


Fig.8

- Re-assemble the previously removed elements.

APPENDIX A

INSTALLATION AND OPERATION MANUAL

- ► **OPERATION MANUAL CKF 024, 030, 036, 045**
- ► **INSTALLATION MANUAL CKF 024, 030, 036, 045**